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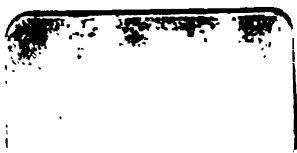
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**ANNUAL REPORT**

**OF THE**

**CHIEF SIGNAL OFFICER OF THE ARMY**

**TO THE**

**SECRETARY OF WAR**

**FOR**

**THE YEAR 1885.**

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**IN TWO VOLUMES.**

**PART 1.**

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# REPORT

OF THE

## CHIEF SIGNAL OFFICER.

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SIGNAL OFFICE, WAR DEPARTMENT,  
*Washington City, October 10, 1885.*

SIR: I have the honor to submit herewith my report upon the work of the Signal Service during the fiscal year ending June 30, 1885.

### INSTRUCTION.

The course of instruction pursued at Fort Myer has been enlarged and otherwise improved, and it now provides for the theoretical and practical instruction of officers and men of the Signal Service in the duties required of the Signal Corps in time of war. It is the theory that all connected with the corps shall be constantly available for all branches of military service for which the Signal Corps is maintained. The signal corps and telegraph train is now recognized by all foreign powers as most essential in modern warfare. In active service the duties require the men to be mounted and the trains must be moved by horses. During the past two years not one animal has been at my command, available for this mounted instruction. The field train should be fully equipped in order that the men may be taught to ride and manœuvre a telegraph train in the field.

During the year ending June 30, 1885, five officers and thirty-six men received instruction in the regular course of military signalling at Fort Myer. In May, 1885, a system of field practice was inaugurated for officers and men on duty at the Chief Signal Office, as follows:

Two details, one officer and one enlisted man each, are made daily for practice in all kinds of military signalling, including the heliograph, field telephones, and telegraphs, and for instruction and practice in military surveying, field sketching and mapping. All officers on duty in the office of the Chief Signal Officer, excepting the officers in charge of the Property and Disbursing and Indications Divisions, are required to take this field practice. The details of officers are made in rotation, from a roster containing the names of all the officers available. The practice is conducted under the personal direction of the Chief Signal Officer. Officers are required to furnish their own transportation.

On June 18, 1885, a division of Military Signalling was established under charge of an officer, whose duties are as follows:

The care and improvement of the field telegraph train, heliograph, knapsack-telephone and telegraph, and signal apparatus in general; the preparation of a manual for instruction in military signalling and management of the field-telegraph train; and the supervision of the

theoretical and practical instruction in signalling of officers and enlisted men at Fort Myer and at this office. To collate all information possible from American and foreign sources in relation to the foregoing subjects.

When necessary for practice or experiment, this officer should have the use of trains and signal apparatus and equipment at Fort Myer.

During the coming year it is intended to replace the old and worn-out signal equipments, now in use by the Signal Corps and at military posts, with new and approved appliances for visual signalling. Some slight progress was made in this direction during the months of May and June. A small manual for instruction of officers and men in signalling is in course of preparation.

It is the intention, also, to have constructed a section of field-telegraph train similar to the field train now used by the Swedish government, the wagons of which are smaller and lighter than those now used by the Signal Corps, and are therefore better adapted to the rougher roads in this country. Some of the wagons are at present being constructed. The pressure of the constantly increasing and expanding meteorological duties of the bureau has, since 1870, caused the purely military duties and responsibilities of the corps to be somewhat neglected, but it is now proposed to remedy this by vigorous study of the theory and practice of the art of military signals. It is proposed during the coming year to erect two permanent military signal stations with a good range between them of about fifteen miles, and to equip them with the latest and most approved apparatus for visual signalling. These stations will be used for practice and experiment, and will be located with a view to use in actual warfare. The subject of military signalling is at present securing special attention in the armies of Europe, and no labor or expense is spared in perfecting their equipments and field-telegraph trains.

The annual report of the officer in charge of Fort Myer, to which special attention is invited, accompanies this report as Appendix No. 1.

During the year four officers completed the course at Fort Myer, including a theoretical and practical course in cavalry tactics, customs of the service, manual of signals, cipher manual, military surveying, electricity, and electric telegraph. Thirty-one enlisted men were instructed in military signalling, telegraphy, elementary meteorology, and in their duties as soldiers and observers of the Signal Service.

In addition to the above, a course of instruction for officers charged with the preparation of weather predictions, the announcement of approaching frost, and the ordering of storm signals has been enlarged, and now embraces a course of lectures by the most distinguished professors of meteorology in this country.

A course of instruction in military surveying, field sketching and topographical drawing has also been added, with a view of increasing the efficiency of signal officers in time of war.

It is my intention, in time, to have all officers of the Signal Corps instructed in meteorology, but at present it is necessary to rely in part upon the services of officers detailed from the line of the Army, who have, by long experience, become proficient in the most important duties of this service. There are officers of the line who have been connected with the service some fourteen years, to whom the service and the country owe a great deal, who, in fact, have done the greater portion of the work which makes the service a necessity, and who ought to be retained in the corps, and it is believed that Congress during the coming session will recognize the importance of retaining these officers of long experience permanently with the corps.



The study of meteorology is greatly stimulated by the work of the Signal Service, and the popular interest in this subject has induced many of the colleges to add a course of instruction in meteorology as a part of the collegiate course. At many of these colleges young men learn of the field of usefulness which the Signal Corps offers, and from this source the service has obtained many excellent recruits.

In some cases lectures have been delivered during the year by professors and enlisted men of the service. To meet the demands for text-books on meteorology growing out of the increased interest in this subject, I directed Prof. William Ferrel, Assistant, to prepare a work that would comprise the best and most useful parts of all scientific papers which have been published. This paper will be found in Appendix No. 71.

This treatise contains the most appropriate and important of the various meteorological papers of original research on the subject of meteorology, presented by more popular methods, better adapted to learners than the methods in the original papers in which it was generally supposed that the reader was familiar with what had been previously published. This valuable work when issued will meet the wants of the colleges of the country by supplying a text-book containing the most advanced researches, and it is earnestly recommended that provision be made for its immediate publication.

Prof. Cleveland Abbe, Assistant, is charged with the preparation of a treatise on the theory of instruments used in meteorology, which, when completed, will serve as a valuable text-book for those wishing to pursue the study of meteorology. Arrangements have been made for the completion of an elementary text-book intended for the use of normal and high schools. These valuable works will be completed during the current year, and the office should be provided with the necessary means for their prompt publication.

The translation of valuable papers on temperatures and storms by Ragona and Wild, are appended. For the former I am indebted to the politeness of Rev. C. M. Widman, S. J., Saint Charles College, Grand Coteau, Louisiana.

The preparation of translation of important treatises on meteorology has been made, and other translations, giving the most recent and reliable results bearing upon the science of meteorology, will be completed during the coming year.

The enlistment of young college graduates, with a view of making them observers of the Signal Service, has been continued during the year with gratifying results.

This plan of securing for the service men of education and general intelligence has now been in operation four years, and of the three hundred and nine enlistments made during that time, eighty-six were college graduates. These young men are first placed under instruction and fitted for station service, and those showing capacity for special work are selected and instructed, with a view of qualifying them for the scientific work of the service.

#### INDICATIONS.

The weather forecasts, based upon tri-daily telegraphic reports, have been regularly issued during the year and, as an evidence of their practical value, they now form an important item of news for the associated press of the country. In a number of cases the daily papers are furnished with special forecasts to satisfy the demands of the public, and this office has been called upon daily to furnish special predictions in the interest of commerce, agriculture, and special trades.

The most important new feature of the indication work during the year has been the large increase in special indications for particular localities. These special forecasts are made daily at 1 a. m. and 10 a. m., for the succeeding day, for the principal centres of population, for lines of railroads and States, and are sent by special message to Signal Service observers, directors of State weather services, railroad officials, and editors, for the information of the public. At the close of the year this office was sending out regularly twenty-nine of these special messages, in addition to the regular indications, as follows:

AT MIDNIGHT.

- To J. F. Boyd, Chambersburg, Pa., railway signals.
- To T. B. Hutchinson, York, Pa., railway signals.
- To Professor Thomas, Columbus, Ohio, railway signals.
- To Professor Mell, Auburn, Ala., railway signals.
- To observers, Boston, Mass., and New Haven, Conn., indications for New England, to be displayed throughout that district by system of flags.
- To editors of "Richmond Dispatch," "Baltimore Sun," "Washington Post," "Republican," "Journal," "Herald," "Chronicle," "Capital," and "Gazette," for those cities and vicinities.
- To observers, Albany, Buffalo, Chicago, Cincinnati, Indianapolis, Louisville, Milwaukee, Saint Louis, and Toledo, for those cities and vicinities.
- To observer, Jacksonville, Fla., for northern Florida.
- To observer, Detroit, Mich., for Detroit and southeastern Michigan.
- To R. B. Gemmell, Topeka, Kans.
- To W. L. Cayle, Springfield, Mo., and observer, Leavenworth, Kans., for Kansas, Indian Territory and western Missouri.

AT 10 A. M.

To observer, Omaha, Nebr., for Omaha and vicinity.  
 To observer, Little Rock, Ark., for State of Arkansas.  
 To observers, Augusta, Ga., and Atlanta, Ga., for State of Georgia.  
 The number of these messages is increasing daily, and to satisfy the wants of the public it is probable that the general indications will be made for individual States and not for large districts, as they are now prepared.

The special bulletin has been issued daily, except Sundays, at 10 a. m. This bulletin contains a more general account of the meteorological conditions than it is possible to express in the limited space allotted to indications. It informs the public of approaching cold waves, storms, frosts, extreme temperatures, etc., and contains forecasts of the weather applicable to the succeeding thirty-two hours, or the following day. When practicable, the Indications Officer is required to make special weather forecasts for selected districts, at midnight, applicable to the succeeding forty-eight hours. With a view of giving the people of the Pacific Coast the full benefits to be derived from the Signal Service, special indications are now prepared for the districts on the Pacific Coast by an experienced officer stationed at San Francisco.

The following tables show the percentage of accuracy of the indications during the year. Each forecast of the several meteorological elements is carefully compared by the Indications Board with the conditions actually occurring during the time for which the forecast was made. The rules by which these percentages have been computed

have been revised, and the use of ambiguous language in the indications prohibited. With these improvements, the wording of the indications, and the rigid manner of determining the accuracy of predictions, I anticipate still further improvements in the work of this division.

An increase of stations in the West and Northwest and in British America would lead to still further improvement in this important branch of the Signal Service work. The reports received from stations located on the sea-coast telegraph line are, in some cases, of special value in preparing the storm warnings, and the benefits thus derived warrant the expenditures necessary not only to maintain this line, but to extend it along the Atlantic Coast from Nantucket to Florida.

*Percentages of indications verified for the year ending June 30, 1885.*

Districts.	1884.						1885.						Annual average.
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	
New England.....	78.8	84.1	78.3	83.0	86.9	81.5	87.2	83.9	86.2	81.2	79.1	83.8	82.8
Middle Atlantic States.....	86.2	83.5	83.9	85.8	86.5	85.2	89.4	83.9	88.8	85.6	82.9	80.9	86.0
South Atlantic States.....	83.8	85.7	88.4	87.2	86.3	82.8	86.1	83.2	88.5	83.1	83.2	85.8	85.8
Eastern Gulf States.....	83.5	85.3	86.7	87.8	84.9	81.4	89.0	84.2	87.3	83.6	87.7	83.2	85.8
Western Gulf States.....	90.2	84.2	86.2	86.3	87.0	80.6	85.7	84.8	86.7	84.7	87.1	87.6	85.9
Lower Lake Region.....	84.0	82.8	77.4	79.1	85.5	75.7	87.9	83.7	86.8	81.0	78.7	87.7	82.6
Upper Lake Region.....	83.7	82.2	78.0	80.5	86.2	78.9	85.5	81.9	84.0	81.0	77.6	85.8	82.1
Tennessee and Ohio Valley.....	85.5	82.3	84.8	81.4	83.3	78.9	85.8	82.8	86.0	86.0	84.2	87.0	84.4
Upper Mississippi Valley.....	84.1	85.4	78.5	78.0	85.0	77.7	84.5	83.2	84.0	85.0	83.7	87.3	83.0
Missouri Valley.....	78.0	76.8	72.6	72.3	79.7	75.3	80.2	74.8	78.5	82.1	80.6	83.8	78.0
Monthly averages.....	83.8	83.2	81.5	82.2	85.6	78.8	86.1	82.6	85.7	83.8	82.6	87.3	83.6

The indications for the districts named in the above table were for character of weather, direction of winds, and changes of atmospheric temperature and pressure.

The following table shows the percentages of verifications for the Pacific Coast regions, the predictions from July 1, 1884, to April 9, 1885, being for character of weather only, and were made at the office of the Chief Signal Officer; those made after April 9, 1885, are for character of weather, direction of wind and temperature, and were made at San Francisco, by the officer in charge of the Pacific Coast Division of the Signal Service:

*Percentages of verifications for the Pacific Coast regions for the months given.*

Districts.	1884.						1885.						Annual average.
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	
North Pacific Coast Region....	87.1	83.9	83.3	80.5	81.2	78.2	77.7	86.0	80.4	84.3	82.3	85.8	83.3
Middle Pacific Coast Region....	98.4	100.0	90.8	89.2	90.8	79.8	70.5	78.9	97.3	78.2	85.7	89.3	87.2
South Pacific Coast Region....	98.4	100.0	98.3	86.7	91.7	76.6	84.8	97.2	99.1	86.6	95.0	94.4	92.5
Monthly averages.....	94.6	94.6	90.8	85.4	87.9	78.2	73.7	90.0	92.8	83.0	87.7	89.7	87.6

The following table shows the number of cautionary signals ordered during the year ending June 30, 1885, with the number and percentages that were justified :

Month and year.	Cautionary signals.			Cautionary off-shore signals.			Cautionary north-west signals.			Total number of signals ordered.	Total number of signals justified.	Percentage of total number of signals justified.
	Number ordered.	Number justified.	Percentage justified.	Number ordered.	Number justified.	Percentage justified.	Number ordered.	Number justified.	Percentage justified.			
1884.												
July .....	122	97	79.5	23	14	60.9	None.	.....	.....	145	111	76.6
August .....	59	28	47.5	None.	.....	.....	None.	.....	.....	59	28	47.5
September .....	140	91	65.0	28	16	61.5	None.	.....	.....	166	107	64.5
October .....	205	149	72.2	43	33	78.6	41	20	48.8	288	202	70.1
November .....	200	122	61.0	81	78	85.7	None.	.....	.....	291	200	69.4
December .....	186	161	86.6	69	59	85.5	None.	.....	.....	255	220	86.3
1885.												
January .....	206	185	89.8	187	169	90.4	None.	.....	.....	393	354	90.1
February .....	160	150	93.8	77	70	90.9	None.	.....	.....	237	220	92.8
March .....	268	234	87.3	156	122	78.2	None.	.....	.....	424	356	84.0
April .....	183	149	81.4	87	29	33.3	None.	.....	.....	270	178	65.9
May .....	168	94	56.0	21	8	38.1	None.	.....	.....	189	102	54.0
June .....	135	119	88.2	62	44	71.0	None.	.....	.....	197	163	82.7
Total .....	2,032	1,639	80.7	791	642	81.2	41	20	48.8	2,864	2,301	80.3

Of the total number of cautionary off-shore signals displayed, 740, or 93.6 per cent., were justified as to direction, and 675, or 85.3 per cent., were justified as to velocity.

#### COLD-WAVE SIGNALS.

The following table shows the number of cold-wave signal displays, with the number and percentages justified :

Month.	Number ordered.	Number justified.	Percentage justified.	Month.	Number ordered.	Number justified.	Percentage justified.
1884—July .....	.....	.....	.....	1885—February .....	145	129	89.0
August .....	.....	.....	.....	March .....	80	70	87.5
September .....	8	2	25.0	April .....	75	66	88.0
October .....	74	57	77.0	May .....	33	25	75.8
November .....	108	106	98.1	June .....	.....	.....	.....
December .....	176	134	76.1	Total .....	946	815	86.2
1885—January .....	246	226	91.9				

Of the 946 cold-wave signals displayed during the year, 815, or 86.2 per cent., were justified.

The work in this important division of the office requires special study and experience to insure the best results, and the assistants who are required to make these deductions should devote their whole time to meteorological study. The force available for the work is, however, so limited as not to admit of such assignments. The assistants who have had the most experience in the preparation of weather forecasts are officers detailed from the line of the Army, and if this service is to

be maintained it should not be deprived of the services of these officers, who have shown by experience that they are competent to perform this important work.

In Appendix No. 2 will be found the rules and regulations relating to the Indications Division.

Appendix No. 3 gives the report of the officer in charge of the Pacific coast weather service.

#### STATIONS.

The number of stations in operation June 30, 1885, in the United States was four hundred and eighty-nine. These include the telegraph stations, printing stations, display, special river, cotton region, sunset, and eight repair stations. In addition, reports are received from twenty-five Canadian stations, by the co-operation of the Canadian Meteorological Service. Telegraphic reports are received at this office daily from one hundred and sixty stations.

During the year sixteen full reporting stations have been established and two discontinued. In addition to reports received from regular stations, three hundred and seventy-five voluntary observers and Army surgeons at fifty-two military posts have furnished monthly reports, which have been used in preparing the current publications of this office. The office has continued to co-operate with foreign observers in collecting simultaneous meteorological reports, and in this work reports have been received from three hundred and thirty-three foreign stations and five hundred and sixty-five naval and merchant marine vessels.

Reports received from the above stations have been carefully compared and tabulated for publication, and these tables contain, not only the results of observations taken during the current year, but in some cases, the means of the several meteorological elements from observations taken since the establishment of the Signal Service. The meteorological tables accompanying this report have been so arranged as to give a complete meteorological history of each station. The weather, temperature, and rainfall for each month of the current year may be readily compared with the normal weather, temperature, and rainfall, and the effect of abnormal atmospheric conditions upon agricultural products may be determined. The report of the officer in charge of the Stations Division will be found in Appendices from No. 4 to 61, inclusive.

#### SIGNAL SERVICE AGENCIES.

Signal Service agencies have been maintained in New York City, Philadelphia, and Boston since November, 1884, with a view of increasing the usefulness of the Signal Service to the merchant marine, to secure a greater number of meteorological observations taken at sea by merchant vessels, to insure uniformity in the methods of making the observations, and to familiarize shipmasters with the signals displayed by this service to indicate the approach of dangerous storms.

The work assigned to this new division of the office has been carried forward with gratifying results under the immediate charge of Sergt. H. J. Penrod, Signal Corps, U. S. A., whose report is given in Appendix No. 62.

#### TELEGRAPH DIVISION.

The regular tri-daily cipher weather reports were received during the year over the wires of the Western Union, International Ocean, Florida, Gulf Coast, and Northwestern Telegraph Companies.

One million six hundred and thirty-nine thousand cipher words of weather reports were received at, and sent from, this office during the year. Seventy thousand two hundred and twenty-five telegrams, other than weather reports, were sent and received during the same period.

On account of the reduced rates for Government telegrams, including the reports sent over circuits, the service was enabled to largely extend the dissemination of weather reports and forecasts for the benefit of the public.

#### SEA-COAST TELEGRAPH LINE.

This line extends along the Atlantic Coast from Smithville, N. C., to Cape Henry, Va., and from Chincoteague, Va., to Sandy Hook, N. J.; it has proved of great value to shipping, and affords a means of rapid communication when assistance may be required. Portions of this line are now used as a telephone line by the Life-Saving Service, and in cases of wreck the crews of life-saving stations are enabled to more promptly reach the scene of the wreck. The value of this line to the Signal Service and to the shipping interest of the country is such as to require not only a liberal appropriation for its maintenance, but an additional appropriation for its extension along the coast.

This service has in a single year, by means of this line, saved property the value of which exceeded the entire amount appropriated for the support of the Signal Service. A contract has been made for the manufacture and laying of the cable to connect Nantucket with the mainland, and it is expected that telegraphic communication will be established with this island during the present year, thus adding to this service a most valuable station for the display of storm signals.

#### UNITED STATES MILITARY TELEGRAPH LINES.

These lines have been constructed and operated by the Signal Service in unsettled portions of the country not occupied by commercial lines, and it has been the policy of this service to discontinue these lines as soon as commercial lines were constructed. The aggregated length of military telegraph lines now operated by this service is 2,779 miles, against 2,805 miles in operation at date of last report. The lines at present operated are distributed as follows:

	Miles.
Department of Dakota .....	893
Department of the Missouri.....	582
Departments of the Columbia and California.....	512
Department of Arizona .....	510
Department of Texas .....	197
Department of the Platte .....	85
Total .....	2,779

The accompanying map exhibits the various sections of United States military telegraph lines now in operation and those abandoned during former years.

The construction of the following new lines has been recommended by the respective department commanders, and will be included in the estimates for the next fiscal year, viz., from Fort Gaston, Cal., to the North Fork of Mad River, Cal., 28 miles; from Fort Halleck, Nev., to Halleck Station, Nev., 12 miles.

The lines have worked well, rendering valuable aid in military operations, and those in the Northwest have enabled the Signal Service to secure important meteorological reports from unsettled regions not occupied by commercial lines. I am indebted for the liberal assistance

rendered by the department and post commanders for aid in the operation and repair of these lines. As these lines are operated for the benefit of the Army at large, it is recommended that legislation be secured authorizing the permanent detail of fifty enlisted men from the line of the Army for duty with these lines, and the enlisted men, while so serving, to receive extra-duty pay from the line receipts. A detailed report of the officer in charge of the military telegraph lines will be found in Appendix No. 63.

#### BOARDS OF TRADE.

This service has continued its co-operation with boards of trade, chambers of commerce, and other commercial organizations in the principal cities throughout the country, and the many applications received from these organizations for an increase of the information furnished by this service indicates the importance of the work. These numerous demands cannot be fully satisfied with the means at the disposal of this service, and the important interests represented by these organizations calls for a more liberal support from Congress. Many of these organizations have appointed meteorological committees, which have proved important auxiliaries to this service, as they confer with the Chief Signal Officer and give information relative to the wants of the particular industries represented, and offer suggestions as to the best means of supplying those wants. Inspecting officers consult with these committees as to the character of the work performed by the observer and obtain reliable information, which enables me to determine whether or not the duties, so far as they relate to distributing information, are properly performed. A list of boards of trade co-operating with this service will be found in Appendix No. 64.

#### STATE WEATHER SERVICES.

The meteorological services organized in a number of States have continued to co-operate with the Signal Service with gratifying results. The New England Meteorological Society performed excellent service in distributing the weather forecasts and special predictions for that section over railroad, telegraph, and telephone lines. The State services in Ohio and Alabama have likewise aided in distributing the special predictions of this service over the lines of railroad in those States, these predictions being telegraphed from this office to the chiefs of the weather services at midnight. Similar arrangements are now being made with the chiefs of other State services for a wider distribution of the weather forecasts of this service. A list of the States in which local State services have been formed will be found in Appendix No. 65.

#### MISCELLANEOUS.

##### COLD-WAVE SIGNALS.

There is scarcely an industry which is not more or less affected by the sudden and marked fall in temperature. This service has long appreciated the value of forecasts which would give the public information as to the approach of cold waves, but it was not until late in 1883 that a definite system was inaugurated and signals displayed giving warning of the approach of these waves. This system of warnings met with immediate favor throughout the entire country, and the press, in most emphatic terms, indorsed the effort made by the service. All

branches of agriculture, extensive fruit dealers, cotton planters, officials of railroad companies, and others, expressed the greatest satisfaction with the warnings, and, in many instances, individuals have purchased flags and displayed them in towns adjacent to Signal Service stations. Railroads and telegraph companies have almost without exception co-operated with the service in distributing these warnings without expense to the Government. All means available are used by the service in giving publicity to the cold-wave warnings, that the greatest benefits possible may result from each forecast. During the present year this system has been greatly extended, the number of stations displaying the signal has been increased, but, owing to the very limited appropriation made for the Signal Service this office has only been able to furnish flags to regular stations and to pay the cost of telegraphing the warnings. An annual appropriation of five thousand dollars would enable me to extend this system of warnings over the greater part of the United States, and the benefits which would result from such warning induce me to earnestly recommend that an appropriation be made for this branch of the service. A detailed report, contained in Appendix No. 54, gives the stations at which cold-wave signals are displayed and evidence as to the practical value of these signals.

#### WEATHER AND TEMPERATURE SIGNALS.

A system of signal flags to indicate the changes in temperature and weather has been greatly extended during the present year. These flags are extensively displayed on lines of railroads and at railroad stations, and communicate the weather forecast made by this office to many who are unable to procure the printed indications. A full description of these signals and the extent to which they have been used is given in Appendix No. 55.

#### RAILWAY WEATHER BULLETINS.

The Signal Service furnishes the weather indications at a fixed hour to any railway company volunteering to transmit them over their lines without charge to the United States. This system of weather reports has proved a most valuable adjunct to the Signal Service. Many railroad companies have generously extended their aid, and the indications are daily posted at hundreds of small towns, villages, and stations throughout the country, and thus thousands of people are kept fully informed as to the probable conditions of the weather in localities where daily papers are not published. A list of railroads co-operating in this work will be found in Appendix No. 56.

#### FLOOD WARNINGS.

The system of river observations and flood warnings of the Signal Service has been greatly improved during the present year.

In November, 1884, special instructions were issued, in pamphlet form, for the guidance of river observers in erecting gauges, taking observations, rendering reports, etc. On January 1, 1885, the special river stations were arranged in sections and placed in charge of the Signal Service observers at section centres. These centres are usually located at some important city where the river reports in the vicinity can be most advantageously collected and published for the benefit of the river commerce. For detailed report upon this subject see Appendix No. 57.



## COTTON REGION REPORTS.

The system of cotton-region reports inaugurated in 1881 has been continued, and the reports are considered of great value to the planters and to the cotton interest throughout the country. Reports of rainfall and maximum and minimum temperatures are promptly distributed daily from the districts centres, and all large cities in the South are supplied with this information. These reports are published in the newspapers and bulletins at cotton exchanges, where they are readily accessible to the business men and general public. Reports are collected and disseminated throughout the cotton region from April 1st to October 31st, each year; this year, however, owing to the small balance of the appropriation available for the purpose the observations were not commenced until May 1st. I have received numerous requests from those interested in these reports urging that they be made continuous throughout the year. These requests should be complied with, and I recommend that the appropriation for the cotton-region reports be increased from seven to twelve thousand dollars. A description of the cotton-region reports will be found in Appendix No. 58.

## FROST WARNINGS.

The system of frosts warnings for the benefit of the tobacco, sugar, and fruit interests of the country has been continued during the year. Special attention has been given to the system of warnings for the cranberry interest in Wisconsin, Massachusetts, and New Jersey, and stations have been established which assure the prompt transmission of frost warnings to the threatened regions.

The railroads in the Southwest transmit by telegraph the warnings of approaching northers issued by this service. Efforts have been made to improve this service during the past year, and a cold-wave station has been established in southern Kansas for the benefit of the cattle interest in that section and in the Indian Territory.

## SCIENTIFIC WORK.

## STUDY DIVISION.

I am pleased to acknowledge the continued valued co-operation of the following consulting specialists in the prosecution of the scientific work of this service:

Prof. John Trowbridge, Cambridge, Mass.

Prof. H. A. Rowland, Baltimore, Md.

Prof. E. S. Pickering, Cambridge, Mass.

Prof. A. W. Wright, New Haven, Conn.

After receiving the favorable indorsement of many European meteorologists, the application of gravity correction to barometric observations was ordered, and the necessary tables were prepared for its introduction, on January 1, 1885. Improved tables for the reduction of barometric pressure to sea-level have been prepared and submitted for adoption in place of the monthly constants now in use. Before making this change it has, however, been thought advisable to refer the subject to the attention of various foreign meteorologists and national weather services, hoping thereby to bring about a greater uniformity in the practical treatment of this important matter.

The question of the proper exposure of thermometers has been carefully considered, and a report on the work thus far accomplished is ready for publication. As a practical application of the results of these in-

vestigations, much attention has been given to the locality and environment of thermometers at all Signal Service stations, and many improvements in their exposures have been made. On January 1, 1885, the time of taking all simultaneous observations of this service was advanced eight minutes, so that these observations are now taken on the even hours of standard time. This change in time was made in conformity with the recommendations of the International Prime Meridian and Time Conference, held in this city in October, 1884. The collection of data relative to tornadoes has been continued, as in past years, and a report on the tornadoes of 1884 has been published. A corps of voluntary tornado reporters send in accounts of all destructive local storms and receive in return the publications of this office bearing on this subject.

The special observation and study of thunder-storms began last year, has been carried on with valuable results. About 15,000 reports from 2,500 observers have been received. Monthly summaries of thunder-storms are compiled for insertion in the Monthly Weather Review, and a report on the thunder-storms of May, 1884, has been published as a Signal Service Note.

The compilation of a general bibliography of meteorology has been continued, and about forty-five thousand titles have been collected, twenty thousand having been added during the past year.

This catalogue will be enlarged, and the work of subject classification completed, during the coming year, thus rendering available for the work of this office an approximately complete index to meteorological literature.

The completeness of the bibliography is due, largely, to the earnest co-operation of meteorologists and librarians throughout the world, many of whom have contributed special bibliographies for their respective countries; this fact, added to its great value to all students of meteorology, renders the immediate publication of the work a matter of the highest importance.

By an arrangement with Prof. S. A. King, aeronaut, of Philadelphia, five balloon voyages have been made for the special objects of studying the distribution of temperature and moisture. The service is indebted to Professor King for doing this work without other remuneration than payment of actual expenses. The records of all his voyages, about two hundred and fifty in all, are now being examined for compilation of meteorological results.

A general report on the water supply of the Yellowstone Park has been prepared, showing that, as nearly as can be estimated, the local rain and snowfall furnishes all the water required for the observed amount of flow of geysers, discharge of rivers, and evaporation.

Prof. Cleveland Abbe, Assistant, has continued in charge of this division, and his detailed report of work performed is given in Appendix No. 66.

#### PHYSICAL LABORATORY DIVISION.

In January, 1885, a division known as the Physical Laboratory Division was organized. This includes the division formerly known as the Meteorological Observatory, and in addition to the custody and care of the instruments, their comparison and adjustment with standards, etc., there was assigned to it the duty of establishing and maintaining a laboratory to which all questions involving experiment may be referred, and in which improvements in methods and instruments may be tested and developed.

In this division the regular work of comparison of thermometers and barometers with the standards of the service has continued during the year. Nearly two thousand barometers have been compared, including about three hundred belonging to private individuals. About two hundred barometers have been repaired, compared, and issued to stations, besides a large number of anemometers, wind-vanes, etc.

The final determination of the standard of thermometry is only delayed by the non-arrival of a few thermometers specially made and compared at low temperatures with the Kew standards. Junior Professor Russell has completed the preparation of a paper discussing the whole question, which will be ready for publication as soon as comparison of these instruments with our own standards can be carried out.

The investigation of the question of hygrometry has been continued. For the purpose of throwing light on some very important points, Junior Professor Marvin was sent to Pike's Peak in March, with instructions to carry out a series of observations at Colorado Springs and on the summit of the mountain. The results, which are being discussed by Professor Ferrel, promise to add much to our information upon this subject.

Several methods of observing underground temperatures have been studied, and it is believed that important improvements in thermometric devices have been discovered. Arrangements are being made for observation of earth temperatures at several points during the coming year.

Studies of the electrical condition of the atmosphere have been continued at Baltimore and Cambridge, and lately at the office in Washington. A continuous photographic record has been maintained at Baltimore. It is my intention to increase the number of stations for the experimental study of this important question as soon as I can determine upon the most practicable forms of apparatus.

Among other problems which have been considered in the laboratory, in addition to the above, may be mentioned the determination of the relative sensitiveness of thermometers with spherical and cylindrical bulbs, when used wet or dry; a determination of the limits of speed necessary in the whirled wet-bulb psychrometer, and a study of the degree of accuracy with which the attached thermometer represents the mean temperature of the mercury in the barometric column.

There is a large class of meteorological phenomena that cannot be investigated by means of the data furnished by the regular observations taken at the regular Signal Service stations, and with a view of obtaining these desired data I have submitted estimates for the construction of suitable buildings and the purchase of necessary instruments for a meteorological observatory and physical laboratory at Fort Myer, Virginia. Many of the instruments necessary for such an observatory are at present in the instrument room at this office, but in the present building no suitable place can be found for mounting them. This service is greatly in need of a first-class meteorological station, where hourly observations may be made of the meteorological elements, or self-registering instruments mounted so that hourly readings of the instruments may be obtained from the records. This observatory should be located at Fort Myer, Virginia, the present school of instruction for the Signal Service, as it affords an excellent exposure for the instruments and would serve as a training school for observers of the Signal Service.

A detailed report of Prof. T. C. Mendenhall, Assistant, in charge of the Physical Laboratory Division, will be found in Appendix No. 67.

## ARCTIC WORK.

During the last fiscal year Lieutenant Greely has submitted his formal report concerning the operations of the Lady Franklin Bay Expedition. He properly decided, in view of the great public interest in his work, that it was better the formal report should be submitted at the earliest possible moment without delaying it for further preparation and elaboration of the scientific appendices.

As far as his limited means would permit he carried out the scientific programme of the Hamburg International Polar Conference, and brought back with him in safety an unbroken series of meteorological, tidal, magnetical, and other observations, which cannot fail to be valuable contributions to the international scheme.

The large number of careful pendulum observations made under favorable conditions, with corresponding time observations, have been transmitted, for reduction and discussion, to the Superintendent of the United States Coast and Geodetic Survey, to whose initiative and expense these valuable observations are largely due.

Elaborate and unbroken series of tidal observations at Fort Conger, supplemented by simultaneous series at six other points in the Arctic Ocean and Robeson Channel, have been submitted to the same official, and it is hoped that through these observations the co-tidal lines of the Polar Ocean and Robeson Channel may be satisfactorily determined.

The Chief Signal Officer has also intrusted to the same department the detailed magnetical observations, which involved over one hundred and fifty thousand separate readings of instruments, for reduction and discussion.

The meteorological observations, including sea temperatures and soundings, as well as valuable observations on the velocity of sound at low temperatures, have been arranged and treated, as fully as the time would permit, by Lieutenant Greely.

Other scientific appendices have either been treated by that officer, or through his efforts have been elaborated by scientific gentlemen whom he has interested in his collections.

The lack of any appropriation for the preparation of these reports has necessarily resulted in these discussions being made gratuitously. Their hearty co-operation, thoroughly in accord with the true spirit of scientific inquiry, merits for these gentlemen the cordial thanks of this bureau.

Beyond the scientific work done in accordance with the outlined programme, the expedition further distinguished itself by supplementary work in the way of geographical discovery. It should be noted to the credit of the expedition that the scientific work was never in any manner neglected in the interest of field-work. The geographical work, considering the force employed, the lack of funds for their proper equipment, and the physical difficulties from shortness of season and the unfavorable ice conditions in such high latitudes, is probably unequalled in the annals of Arctic exploration. The extent of the work done may be best shown by the statement that it covered nearly three degrees of latitude, and above the eightieth parallel reached over one-eighth of the circle of the globe.

In the autumn of 1881, Lieutenant Greely succeeded in establishing several depots for future journeys, and in extending the work of exploration in the vicinity of his winter quarters. During the spring and summer of 1882, besides the many short trips of exploration, four im-

portant journeys were made. The first, under Doctor Pavy, attempting to discover land northward of Cape Joseph Henry, failed through the disintegration of the polar-pack, which left the party drifting for a day just south of the eighty-third parallel. Two trips of Lieutenant Greely himself, one in the spring and the other in the summer, resulted in the successful penetration and exploration of the interior of Grinnell Land. The farthest point reached in Lieutenant Greely's second trip was the summit of Mount Arthur, from which he discovered the northern portion of Grinnell Land to be covered by an ice-cap of probably six thousand square miles area, which pushes southward, in the form of glaciers, through all the valleys of two mountain ranges, named Garfield and Conger. These glacial off-shoots feed a large lake, of over three hundred square miles area and at an elevation of five hundred feet above the sea. This lake, named by Lieutenant Greely after the Chief Signal Officer, drains by a considerable river through Chandler Fiord into Lady Franklin Bay. The valleys adjoining the lake were found covered with an unusually luxuriant vegetation, which afforded sufficient pasturage for large herds of musk-oxen.

The discoveries of the ensuing year showed a large ice-cap to the south of the fertile belt of his farthest west. These explorations consequently revealed remarkable physical conditions in Grinnell Land, which have been hitherto unsuspected, *i. e.*, a series of fertile valleys extending from Robeson Channel to the western Polar Sea, hemmed in to the northward and southward by ice-caps of immense thickness, which feed glacial lakes of considerable extent, drained by rapid rivers into the Polar Ocean.

Professor Nordenskiöld hoped for but failed to find similar physical conditions in Danish Greenland, nearly a thousand miles south of the point where Lieutenant Greely found them in Grinnell Land.

The most brilliant expedition of the year was that of Lieutenant Lockwood, who was charged by Lieutenant Greely with the exploration of the north coast of Greenland. Lieutenant Lockwood during an absence of sixty days, travelled with sledge nearly a thousand miles, and succeeded in reaching, with Sergeant Brainard and Eskimo Christiansen, May 13, 1882, Lockwood Island, latitude  $83^{\circ} 24' N.$ , longitude  $40^{\circ} 45' W.$ , whence he saw, fifteen miles to the northeast of his farthest land, Cape Washington, in about  $83^{\circ} 35' N.$ ,  $38^{\circ} W.$

Lieutenant Lockwood commended in the highest terms the energy and good judgment of Sergeant Brainard, and also the remarkable manner in which the supporting party, consisting of Sergeants Jewell, Ralston, Lynn, Elison, Corporal Sailor, and Private Frederick did their portion of the work.

The general results of Lieutenant Lockwood's work may be summed up, not only in the fact that he advanced the American flag to an unparalleled latitude, but that he carried Greenland over forty miles of latitude northward, and over ten degrees of longitude to the eastward of the extreme point which had ever been seen by his predecessors. He added over a hundred miles of previously unknown coast, which consists of precipitous highlands, intersected by broad deep fiords of unknown extent. Lieutenant Greely points out, as a gratifying feature, the entire freedom of the party from sickness or disaster of any kind. He further says:

In accomplishing this work Lieutenant Lockwood displayed a remarkable amount of energy, courage, and perseverance. His success, which I cannot judge as otherwise than as grateful to the country, was won only by great endurance and much physical

sufferings on the part of himself and his party. I cannot do otherwise than especially invite the attention of the War Department to his work, and commend his memory to the most favorable consideration of his superiors. His labors in extending northward the limits of Greenland, and later in determining the western outlines and the interior conditions of Grinnell Land, resulted in important additions to our knowledge of the physical features of that part of the Arctic Circle. His work reached from Cape Washington, 38° W., to Arthur Land, 83° W., thus covering above the eightieth parallel one-eighth of the circle of the globe. He worthily upheld the honor of the American for courage, energy, and perseverance. If his tragic fate awakened the sympathy of the world, none the less should his successful work receive recognition. He unfortunately did not return for merited promotion.

Under similar circumstances it would have seemed grateful had my death and services been announced to the Army in general orders, and such tribute, I trust, may yet seem proper to Lieutenant Lockwood's memory.

He also acknowledges the extraordinary energy and determination of the supporting party, and the remarkable adaptability shown by them for the work. After quoting Lieutenant Lockwood's remarks of commendation, Lieutenant Greely adds:

It is justice to add that Sergeant Brainard was, of necessity, repeatedly assigned by me, in connection with the work of the expedition, to an officer's command, and that his conduct was uniformly such as to win commendation. Apart from his valuable service in the field I believe that he possesses qualities which merit reward and which would render his promotion to the grade of second lieutenant most suitable. I heartily recommend such promotion.

In 1883 Lieutenant Lockwood's attempt to further explore the Greenland coast was carried out with remarkable rapidity until he was obliged, by the disintegration of the polar-pack in the neighborhood of Cape Bryant, to return to Fort Conger.

During this trip Sergeant Brainard and Eskimo Christiansen narrowly escaped being set off in the Polar Sea by the breaking up of the pack.

Later in that year Lieutenant Lockwood, sent by Lieutenant Greely to attempt the crossing of Grinnell Land, succeeded, *via* Archer Fiord and Beatrix Bay, in striking a series of valleys which enabled him to cross the divide and strike salt water in Greely Fiord, which opens to the westward into the Polar Sea. From his farthest point Lieutenant Lockwood saw a distinct cape (Cape Lockwood), which was believed to be on a new land, which was named, after the President of the United States at that time, Arthur Land.

This highland probably consisted of the same mountains which were seen in that direction by Lieutenant Greely the preceding year, from the summit of Mount Arthur, forty-five hundred feet elevation.

The most striking result of Lieutenant Lockwood's trip was the discovery of a remarkable ice-cap which covers the interior of Grinnell Land to the southward. This ice-cap, named by Lieutenant Greely Mer de Glace Agassiz, presented for over fifty miles as a front an unbroken wall of ice averaging one hundred and fifty feet in height, broken only at two places sufficiently to permit a possible ascent. Lieutenant Greely says:

During this journey Lieutenant Lockwood and Sergeant Brainard displayed energy, endurance, loyalty, and pluck which was hardly second to their record of the previous year on the shores of the frozen Polar Sea. For nearly a week the entire party lived on less than half rations in order to render as complete as possible their work of exploration and discovery.

Lieutenant Lockwood's loyalty in this matter impressed me with particular force. He had deemed the crossing of Grinnell Land an impossibility, and in starting out had entreated me to permit him instead to examine the glacial system of Lake Hazen,

His persistency, energy, and fidelity in attempting the route from Beatrix Bay, after failing in Ella Bay, evidenced most strongly his determination that his commanding officer's idea of the practicability of the crossing of Grinnell Land should not fail through him. \* \* \*

The brilliant geographical work of the second year was accomplished despite the recommendation of his surgeon to Lieutenant Greely that he should abandon work of that character on the ground of possible accidents. Lieutenant Greely's letter (enclosure No. 63 to his report) indicates the proper spirit on the part of an officer and soldier charged with important and dangerous work.

Provision for retreat was not neglected for geographical work. Despite the same medical objections Lieutenant Greely wisely accumulated, as early as February, a store of provisions at Cape Baird, which was later used during his retreat. These stores were supplemented later by other supplies and also by the addition of the English boat, which had been brought by Sergeant Rice and party from Thank God Harbor during April.

On the first of August the party was completely prepared for a retreat in case no vessel should reach them during the ensuing week.

The two years' work of scientific observations and geographical explorations were made successfully, without sickness or disaster, as is shown by the following extract from the report:

\* \* \* \* \*

The condition of the party for the coming retreat was one of general strength and health, despite their arduous labors of two years amid unequalled cold and darkness. Of the seven hundred and twenty-one days spent at Fort Conger, two hundred and sixty-eight days had been marked by the total absence of the sun. On two hundred and sixty-two days one or more sledge parties had been absent in the field, on journeys entailing from two to sixty days' absence, and some three thousand miles have been traveled by such parties. An unequalled latitude to the north had been attained, to Greenland over a hundred miles of new coast had been added, and to the westward Grinnell Land had been crossed, its interior surveyed, its physical geography determined, and the contours of its northern half fixed with considerable certainty. This geographical work had been done without disaster, without physical injury to any one, and for its prosecution no part of the scientific work for which the expedition was formed had been neglected or abandoned.

The programme of observations had been carried out as fully as instruments and circumstances would permit, and during the two years there had, on an average, been made and recorded daily fully five hundred observations.

In accordance with his instructions, Fort Conger was formally abandoned on the 9th of August, the earliest moment at which Archer Fiord could be crossed. The attempt, even at that early date, nearly caused the destruction of the launch. By indomitable energy the party, in twenty days' time, with their boats reached Cape Hawks, at the southern extremity of Dobbin Bay, in sight of Cape Sabine. They had been delayed by fog, violent gales, densely packed floes, and at one point were four days embayed by new ice. Their boats were almost hourly in danger of destruction, and serious nips were of frequent occurrence.

Of the Cape Hawks depot taken up by him, Lieutenant Greely says:

The depot consisted of three hundred and forty-two pounds of stearine, one hundred and sixty-eight pounds of preserved potatoes, about six gallons of rum, and some two hundred and fifty pounds of bread. Fully nine-tenths of the bread had spoiled since our previous visit, and, owing to the grave uncertainty of the future, the entire amount was carefully examined for such as was serviceable, and a considerable quantity of that taken was so mouldy that it was barely eatable. In connection with subsequent events it may, perhaps, be properly stated that not exceeding a hundred pounds more of bread could possibly have been selected from the unserviceable amount left, and all of this was permeated and covered by a slimy, green mould, which rendered the bread unfit for any one, and eatable only by a starving man.

To supplement our small amount of coal, then reduced to about four hundred pounds, all the casks at Cape Hawks were broken up and taken on the launch, to be used for steaming purposes.

We left Cape Hawks at 4.25 p. m. and ran southwest nearly an hour, finding the old ice increasing in amount and in places cemented thickly together with young ice. My judgment at the time of the situation is best shown by a literal quotation from my journal of that date: "I cannot but feel that we are now in a critical situation, not knowing what can be depended on. Since no vessel reached this point in 1862 and 1883 (to this time), we must all feel an uncertainty as to the party for our relief being at Life-boat Cove."

On August 28th the boats were beset in attempting to reach Victoria Head from Cape Hawks.

On September 10th Lieutenant Greely, abandoning his launch and one boat, endeavored to reach Cocked Hat Island, about eleven miles distant. Severe gales on two occasions, when they were almost within reach of shore, drove them into the middle of Kane Sea, and only after thirty days' exposure on the moving pack did they succeed in reaching land at Eskimo Point, in Baird Inlet.

The journal of Lieutenant Lockwood confirms fully the statement that Lieutenant Greely persisted in his purpose to reach the Greenland coast from the drifting ice-pack, despite the unanimous opinion of his officers and men to the contrary, and that he attempted to reach the Ellesmere coast only when the action of the elements had made such course the only practical one. Had he been able to carry out his plans he would have reached the Cape York natives, where he could have wintered. I had expected Lieutenant Greely would succeed in doing this, and in it was my hope for his safety. In this particular only, and by no fault of the party, has it failed me in any of my expectations.

The retreat by boats from Fort Conger to Cape Sabine may well be called the most remarkable boat journey of the age, and well justifies the encomiums passed on it by a high English authority on Arctic ice navigation, as a journey demanding unusual powers of executive ability and as evidencing remarkable capacity for command. The route along the coast was three hundred miles in length, but the tortuous course followed, necessitated by the ice-conditions, entailed over five hundred miles' travelling. This journey was made through straits and seas filled with ice of remarkably heavy character, the navigation of which is always most dangerous, and frequently destructive. It is evident that such a journey could only be made by a combination of prudent and daring measures, by the result of which the commander must stand or fall. Whatever inexperienced critics may characterize as errors, it none the less follows that Lieutenant Greely brought in health and strength his entire party, and in safety all the records and important scientific instruments connected with his two years' work, to the appointed place at Cape Sabine, and, but for the rashness with which the "Proteus" was forced into the ice, the entire party would have returned in health.

Lieutenant Greely outlines the condition of affairs during the retreat, and at the time of landing, as follows:

The general conduct of the party during the exhausting labor necessary in constructing stone huts, as well as during our dangerous drift on the ice-pack, was exceedingly creditable. It was but natural that great physical sufferings, from lack of proper shelter, continued excessive work, and insufficient food, should react on the mind, and cause murmurs and discontent, which at times broke into indiscreet remarks and reflections. This impropriety was only on the part of a few members, and as detailed in the attached journals of Lieutenant Lockwood (written in shorthand at the time) and Sergeant Brainard. Fortunately the party, as a whole, was never otherwise than subordinate and united. That subordination had been our safety in our four hun-



dred miles travel, which had ended in the party of twenty-five landing in health and strength, with records and instruments safe, on the barren coast of Ellesmere Land.

This courage, good behavior, and loyalty may theoretically seem a matter of course in the common interest, which could be subserved only by unity and harmony, but when death, starvation, and great physical suffering impend, the temptation for the strong to appropriate all and sacrifice the weak is certainly very great. \* \* \*

The preservation and successful transportation of his records and instruments to Cape Sabine resulted from Lieutenant Greely's forethought and systematic arrangement of them to this end. His strong determination to save these doubtless had some effect in producing a corresponding spirit in the men, as evidenced by their unanimous action regarding the abandonment of the pendulum. Lieutenant Greely says:

The pendulum being a heavy and cumbersome instrument, I informed the men that while the saving of it was much to be desired from the value of subsequent comparative observations, yet it could not weigh against the chances of any man's life, and that whenever any one thought his life endangered by hauling it, or any one insisted on its abandonment I would do so. To the credit of the party no man ever hinted at the abandonment, and most of them were outspoken for its retention to the last. \* \* \*

Pending report of men sent out to learn the condition of affairs at Cape Sabine, winter quarters were erected at Eskimo Point.

As Lieutenant Greely had abandoned one boat on September 12th, in deference to the unanimous recommendation of his officers and men, but one boat remained, preventing any movement until he learned, on October 9th, that three other boats were within his reach on the same coast. There is no desire on the part of the Chief Signal Officer to enter into any detailed discussion of certain phases connected with this expedition which have engaged the public attention, and unfortunately assumed in some measure a form of controversy.

Lieutenant Greely's report is confined entirely to facts which were within his knowledge while at Cape Sabine, and he carefully avoids committing himself to any theory as to the line of conduct which should have been followed by Lieutenant Garlington or others.

The facts in this report speak for themselves, and, limited as they are to a plain statement as to the condition of affairs and the effect produced by them on his future action, need no elaborate treatment or comment.

The following extracts from his report covers the condition of affairs at Cape Sabine, as developed on his arrival there:

The 9th of October was an eventful day to the party; Sergeant Rice returned bringing us news. He brought the record of Lieutenant Garlington, dated July 24th (Appendix No. 116), which informed us of the sinking of the "Proteus" on the 24th, and that Lieutenant Garlington and her crew had gone to the east coast to communicate with U. S. S. "Yantic," or a Swedish steamer. Rice discovered three caches; the English one of two hundred and forty rations; the Beebe cache of two hundred and forty rations; aggregating four hundred and eighty rations; and the wreck cache, which, from Lieutenant Garlington's report, contained five hundred rations of bread, sleeping-bags, tea, and a lot of canned goods. The record further said: "Cache on Littleton Island and boat at Cape Isabella." The words "two hundred and fifty rations" contained in Lieutenant Garlington's copy as furnished to the court of inquiry, was not in the original record.

The modification of Lieutenant Garlington's record is referred to, as the record left had an important bearing on my subsequent actions. The record informed me of the disaster to the "Proteus," and Lieutenant Garlington's positive assurance that "everything within the power of man to rescue my party would be done."

His declaration that he left for the east coast to endeavor to open up communication and pointed out that if the "Yantic" failed him a Swedish vessel was possible, were construed as conveying to me in the strongest terms his fixed determination to return to Cape Sabine if either steamer was fallen in with, and I could look to him for relief.

Two courses were open to me. One to proceed to Cape Sabine, await possible assistance thus promised, and, if it did not come, to cross to Littleton Island by sledge as soon as the channel should close.

Those who are inexperienced in the varying phases of Arctic ice-conditions cannot clearly understand why Smith Sound crossed in whale-boats during July should be impossible for similar boats in October. In July, with its ever-present sun, Smith Sound is generally an open sea free from ice, but in October, 1883 it was filled with floes and ground-up ice, continually driven about by heavy tides and severe storms, while the scant six-hour sun of October 10th disappeared entirely for the winter only sixteen days later.

Our experience of the previous thirty days had shown the impossibility of crossing the upper part of Smith Sound, owing not only to the large quantities of heavy ice moving southward, but particularly on account of the prevalence of rubble and slush-ice, among which young ice was continually forming, which would neither permit the passage of a boat nor bear the weight of a man.

Our experience had been somewhat similar to those of naval expeditions under like conditions. The drift party of the "Polaris" had been unable, in that channel and in sight of that very spot, to make land but a few miles distant; failing, says the official narrative, "despite the most persistent efforts." On the east coast of Greenland the crew of the "Hansa," in January, 1870, had been unable to reach shore but two miles distant, although their lives appeared to depend on their success.

Two months before, to a day, a powerful vessel of the Navy had been forced out of the lower and less dangerous portion of this sound, owing to the dangers of its navigation.

By extraordinary exertions and fortunate circumstances we had been able to make land twelve miles off, without sacrificing, as did one of these parties, their entire scientific collection.

In consequence of this condition of affairs, a movement to Cape Sabine meant a permanent camp until relief could come by vessel that fall, or the straits freezing over to permit crossing by sledge. The second course was to turn our faces homeward, and taking the second boat at Cape Isabella, push southward to Clarence Head along the west coast, and from that point attempt the Cary Islands, where we would be safe, or, the ice-conditions precluding that course, in desperate strait, push still southward in the hopes of being able to cross Jones and Lancaster Sounds and reach Pond Inlet.

Smith Sound, from Isabella southward, opens like a fan, so that, necessarily, the ice spreading in early fall leaves large water-spaces, which freeze over at a very late date, if at all. During our stay at Eskimo Point, the ice had frequently opened up so that a voyage could have been made by boat to the southward, and by ship across Smith Sound to the eastern shore. As far north as Cape Isabella, Smith Sound was navigable for ships most of the time until after November 4th. In short, the ice was a pack, changing with every wind and tide, which was fringed with young and slush-ice, though in general not of a heavy character.

The prevailing sentiment of the party plainly favored a movement to Cape Sabine, where all possible help was pledged, and I decided on my own responsibility to move to that point, reluctantly turning my back to the southern trip, which might have involved the entire destruction of the party or have secured its ultimate safety.

This report of facts confirms the opinion already put forth by the Chief Signal Officer in his statement to the Proteus Court of Inquiry, that the record left at Sabine, holding out promises of assistance, had an important, if not disastrous, effect upon Lieutenant Greely's subsequent action, since these promises were not fulfilled, but led to a false security. It also confirms the soundness of the Chief Signal Officer's judgment in recommending an autumn expedition in 1883. The terms of Lieutenant Greely's report show that Smith Sound, as far northward as Cape Isabella, was navigable into the early days of November.

It is further clearly shown why Smith Sound could not be crossed by Lieutenant Greely, and what has been overlooked by many is pointed out, that he had four boats within reach in the neighborhood of Cape Sabine.

As regards the small depot at Isabella, extraordinary exertions were made to secure it, and it was brought in November to the middle of Baird Inlet, where it was abandoned to save the life of a frost-bitten

member of the party, Sergeant Ellison, who later died from injuries received in that journey. A similar attempt the ensuing April resulted in the death of Sergeant Rice.

The whole report shows a remarkable husbanding of strength, food, and fuel, which had important results in preserving the lives of the survivors.

The spirit of courage, subordination, and discipline which prevailed at Sabine among the party, was doubtless due to Lieutenant Greely's programme of systematic living, amusement, and occupation. That he was ever mindful of the scientific character of the expedition is shown by the following extract:

On the 4th of November regular barometer observations were commenced, from a barometer abandoned by Lieutenant Garlington at Cape Sabine, and these observations were made every four hours from 7 a. m. to 7 p. m., until the instrument was broken, about three weeks before the final rescue of the party. Gaps in the record necessarily occurred towards the latter part of the time, owing to the diminishing strength and deaths of the observers. During the winter months of total darkness the thermometer was rarely read, except at 11 a. m., as I was unwilling to subject any member of the party to unnecessary exposure, even in the scientific interest of the expedition.

The last temperature and weather observations were made forty hours before the rescue.

The fact that the centre of Smith Sound remained open the entire winter prevented any crossing by sledge to the eastern coast, but an attempt was made to communicate, which resulted as follows:

On February 6th Sergeant Rice and Jens returned about 2 p. m., well, but thoroughly exhausted, especially the Eskimo. Sergeant Rice reported that open water extended from ten miles off Wade Point and a mile off Brevoort Island, as far north into Kane Sea as the eye could reach. At no time was the Greenland shore visible. There was much moving ice, with dense water-clouds along the edge of the fast ice. He thought he reached a point as far south as Littleton Island, and about ten miles distant. The two men suffered very much, as may be supposed, the temperature being from  $-18^{\circ}$  to  $-36^{\circ}$ , with one severe storm.

Late in March Lieutenant Greely, in hopes of obtaining game from Alexandra Harbor, some twenty-five miles westward of Camp Clay, sent Private Long and an Eskimo to that point. A thorough search showed that no game had wintered there that season.

During this trip Private Long reached a point which enabled him to extend the southern part of Hayes Sound some twenty miles further to the westward than ever before known. With a view to this work, Lieutenant Greely had carefully instructed Private Long before the trip, in order that such journey might not be fruitless in contributing to the object for which the expedition was planned. The spirit which animated the expedition in regard to scientific work is shown by the following extract:

The variability of spirits and the indomitable courage of the party were evidenced by Sergeants Brainard, Jewell, and Israel volunteering to go into Hayes Sound for geographical explorations in May in case Long succeeded in obtaining game, and later the doctor added his name. I had talked much of sending a party into that sound in May for the purpose of exploration, more to encourage the men than for any other purpose, and such discourse and planning appeared to have borne good fruit.

During the autumn several small seals were obtained, in March nearly a hundred pounds of birds, and in April a young bear. This meat, together with about twelve hundred pounds of shrimps and sea-weed (largely obtained by Sergeant Brainard) and the addition of the seal-skin clothing, saxifrage, and such roche de tripe lichens as could be gathered, supplemented their food supply.

One death from disease occurred in January, followed by many deaths of starvation in May, which, checked by the capture of the bear, commenced again the middle of May, and continued to the end.

Where the facts in the case have made it incumbent on Lieutenant Greely to mention breaches of discipline and misbehavior on the part of any member, the moderate and impartial tone taken by him cannot but be remarked. When the sense of official duty has not required expression, he has spoken kindly or not at all, but has left all unimportant matters to be described in the journals of Lieutenant Lockwood and Sergeant Brainard, as he well says, "by a dead and by a living witness."

In connection with the last year, Lieutenant Greely says:

In regard to the general conduct of the expedition during the year after leaving Fort Conger, any impartial critic must speak of it in terms of commendation. Courage, patience, and fortitude characterized all, both living and dead. If, in a few cases, impatient spirits gave expression to indiscreet and insubordinate utterances, yet such feelings vented themselves in words, without demoralizing the party or weakening the bonds of discipline which united us as a whole.

As to cases where men were guilty of appropriation of the food of others to themselves, I bear in mind now, as then, the great temptation which slowly starving men must experience when food is within their reach. The spirit of conciliation and forbearance which I so long exercised while such a policy seemed possible without fatal results, was followed by the execution of Private Henry, which the exigency of the case demanded. I attach herewith, as appropriate appendices, the orders in the case, as well as a previous report to the honorable the Secretary of War, and his reply approving my course in the matter. (See Appendices 128, 131, 132, and 133.) It was only after repeated thefts that this terrible retribution fell upon Henry. The execution was regarded by me simply in the light of a self-defense for the remnant of my party and myself. While deeming the punishment merited, I appreciated fully the tremendous temptation it was to a man like Henry (who was, as he acknowledged himself, devoid of moral principles) to take that which was before him, and which would, in a measure, satisfy him physically.

As to other matters which have engaged an undue share of public attention, while having no official knowledge of the facts in the case, yet the responsibility for action in connection with such an expedition rightfully and properly rests upon the commanding officer.

In assuming the responsibility in that connection, I know of no law, either human or divine, which was broken, and so do not feel called on as an officer or a man to dwell longer on such a painful topic.

In Appendix No. 134 will be found the dates and causes of death of the various members of the expedition.

I should be unjust to the dead, whose arduous labors, heroic endurance, and unflinching determination advanced the national ensign into an unparalleled latitude, carried out the programme of international scientific observations, increased perhaps in an unequalled degree in this century our knowledge of the physical characteristics and configurations of polar lands, and who, more than all, in the most remarkable boat journey of the age, brought safely, at the price of great bodily suffering and diminished chances of life, through a dense polar-pack, these records to a point whence they would eventually reach the world. They died for that end, and should not be forgotten.

It would be equally unjust not to mention the services of the living. The lack of precedent forbade the War Department from confirming appointments and promotions made by me in the exigencies of my position. The necessity of maintaining the dignity of the service likewise interfered to their detriment when public interest was in a way of rewarding them with moderate fortunes.

Two of these men, Hospital Steward Henry Biederbick and Sergeant J. R. Frederick, have been discharged the service on surgeon's certificate of disability; and in a maimed condition are adventuring the gain of their livelihood. The three remaining are now members of the Signal Service, on application of the Chief Signal Officer. As a reward in some way commensurate with the successful work done by them, and the extraordinary suffering entailed through no fault of their own, I respectfully recommend that their Arctic services may be considered as rendering all these men eligible for appointment to the retired list of the Army, as of the grades of signal sergeants and hospital stewards.

Regarding Lieutenant Greely, the Chief Signal Officer trusts that proper recognition may be taken of his services by renewal and passage of the bill reported favorably at the last session of Congress with a view to his becoming assistant to the Chief Signal Officer. A good war record, wounds, and twenty-four years' honorable service (seventeen in connection with this corps), apart from his remarkable Arctic service, entitles him to this consideration. His present physical condition precludes active cavalry service, and, under present prospects, relieved by law from signal duty, he would go, after a quarter of a century's service, to the retired list, a lieutenant. His loss would be a misfortune to the Signal Corps, with which he has distinguished himself, and to the successful organization and perfection of which he has materially contributed. The experience of the past year emphasizes the importance of a field officer as assistant to the Chief Signal Officer. Under present arrangements any absence of the Chief Signal Officer results in the administration of the bureau by the Disbursing Officer, who necessarily supervises and authorizes his own disbursements. The debt still due both the dead and the living of the International Polar Expedition, led by Lieutenant Greely, which so perfectly performed all its work, it is believed the country is anxious and ready to meet, and it is hoped that no question as to the faults of others, and for which they are not responsible, may prevent so just a purpose. Fitting recognition is due the memory of Lieutenant Lockwood, who so heroically carried the ensign of his country further into the mysteries of the North than any other was ever carried. Promotion to Lieutenant Greely and Sergeant Brainard, whose pathetic stories are now ready for the world, and whose records of efficiency, courage, and generosity are all that highest manhood could make them, should be quick and fitting, while the four remaining survivors should be put upon the list of public servants whose accomplished work entitles them to public support.

Lieutenant Ray, having completed the work for which he was detailed, promptly asked to return to his regiment. An officer of the line, without special training for the delicate duties imposed, Lieutenant Ray executed his trust with great fidelity and efficiency, showing throughout the best qualities of a gentleman and soldier.

#### APPROPRIATIONS.

The limited appropriation for the support of this service during the last fiscal year left it in a crippled condition, and I have not been able to fully meet the demands for special reports and weather forecasts from the various sections of the country. The service has been maintained and good result secured, but it has been impossible to carry on the full work of this bureau, while a slight increase in the appropriation would have enabled me to more fully disseminate the information collected at this office, thus securing greater benefits to the people.

The number of stations for the display of cautionary signals on the lakes should be increased to meet the demands of those interested in lake navigation, and the necessary funds supplied, which will enable me to keep these stations open at night. The cotton-region reports should be made continuous, but the meagreness of the appropriation for this branch of the service prevented me from commencing this system of report before May 1st.

The appropriation laws of the last three fiscal years were framed under the expressed wish of Congress to separate the appropriation for this

service from those made for the support of the Army. From its organization until recently, the Signal Service has been provided for as a part of the Army. The military duties of the corps are strictly performed, the battalion is organized and under drill, and ready for the performance of its proper duties in time of war.

The meteorological work performed by the Signal Service had its origin and development in the War Department, and, besides being by that right a part of it, it is the most valuable feature of Army work in time of peace, and it is now recommended that while the items of appropriation for the service remain separate and specific, they be made as a part of the appropriation for the Army.

Referring to the appropriations for the fiscal year ending June 30, 1886, I desire to call especial attention to the fact that the estimates submitted have been prepared with great care, and cover only the absolute needs of this service which experience has demonstrated should be provided for, if it is the intention of Congress to maintain the work of this bureau on an efficient basis. If such is not the intention, then the appropriation of anything is wasteful. The people demand an equivalent return for their money, and by inadequate and ambiguous appropriation laws, resulting in a crippled condition, the Signal Service has been unable to satisfy the wants of the agricultural, commercial, and general interests of the country. No other bureau or department of the Government is so hampered by provisos as is this, and as the various branches of work of the service are inseparably connected one with the other, and all contingent upon ample appropriations, it follows, that, while in some items the amounts asked have been given, yet the omission to appropriate in some other item has resulted in the failure of both, as one could not be utilized without the assistance of the other.

The appropriation for fuel is not sufficient for our stations, many of which, in the extreme northwest country, require fires nearly the entire year, and in those latitudes the cost of fuel is proportionately high; the officers of the corps, and those doing duty therewith, have been allowed (as are all officers of the Army), by paragraph 1851, Army Regulations, to purchase fuel at a fixed rate, the Government paying the difference, but by the insufficiency of the appropriation for the fiscal year 1885 this privilege has been denied to them for a portion of the time, and by the failure to insert the necessary proviso in the appropriation acts for 1886 they have been entirely deprived of this legal privilege, thus enacting an unjust discrimination against the officers of this corps and those doing duty therewith.

The estimate for maps and bulletins should be favorably considered, and the amount asked be appropriated, for it is this appropriation which furnishes the means by which the investigations of this service are presented to the public, and a cutting off of any portion of the amount estimated for will entail not only embarrassment but oftentimes complete failure in the dissemination of such information as the public demands from this service.

The total amount of the deficiencies for the fiscal year ending June 30, 1886, is \$396,167, of which \$300,000 are for the purchase of a site and the erection thereon of a fire-proof building for offices suitable for the uses of the Signal Service, and it is especially urged that this particular item may receive favorable consideration, as well, of course, as all others.

It is also respectfully suggested that the Secretary of War recommend the addition of the following clause, viz: "And except such

sums (not to exceed \$3,000) and except such services as the Secretary of War may, in his judgment, deem necessary for the best interests of all concerned," to the proviso in the Army bill which prohibits the use of any money appropriated for other parts of the Army by or for the Signal Corps.

*Statement of amounts appropriated for the support of the Signal Service, U. S. Army, for the fiscal year ending June 30, 1885.*

**Legislative, executive, and judicial:**

Regular clerks, messengers, &c.....	\$10,660 00
Scientific experts, clerks, &c.....	45,000 00
Postage stamps, postal union countries, allotted by Secretary of War .....	1,080 00
Stationery allotted by Secretary of War .....	3,583 34
Rent of buildings for Signal Office.....	7,000 60
Contingent expenses allotted by the Secretary of War.....	7,017 49
<b>Total .....</b>	<b>74,340 83</b>

**Sundry civil expenses:**

**Observation and report of storms—**

Manufacture, purchase, and repair of instruments.....	\$5,500 00
Telegraphing reports.....	136,000 00
Expenses storm signals.....	10,000 00
Cotton-belt reports.....	7,000 00
Connection life-saving stations.....	5,500 00
Instrument shelters.....	2,000 00
Rents, &c., of offices outside of Washington.....	40,000 00
River and flood reports.....	10,000 00
Maps and bulletins.....	25,000 00

**Total .....** 241,000 00

Maintenance and repair of military telegraph lines.....	\$24,000 00
Stations on Nantucket Island.....	40,000 00

**Pay, &c., of the Signal Corps:**

Pay of officers.....	\$30,500 00
Pay of enlisted men.....	200,000 00
Mileage to officers.....	5,000 00
Pay of contract surgeons.....	1,200 00
Commutation of quarters to officers.....	8,208 00
Cost of telegrams.....	250 00

**Total .....** 245,158 00

**Subsistence Department:**

Subsistence and commutation of rations, Signal Corps.....	\$155,000 00
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**Total .....** 155,000 00

**Quartermaster's Department:**

**Regular supplies—**

Fuel.....	\$6,200 00
Commutation of fuel, at \$9.00 per month.....	23,760 00
Commutation of fuel, at \$3.00 per month.....	23,328 00
Forage for mules and horses.....	3,100 00
Stationery.....	100 00
Stoves, and repairs to heating apparatus.....	600 00
Lights.....	300 00
Straw for animals.....	217 00
Straw for bedding.....	46 00

**Total .....** 57,651 00

## Sundry civil expenses—Continued.

Incidental expenses—	
Horse and mule shoes.....	\$500 00
Blacksmith's and other tools.....	400 00
Veterinary supplies.....	300 00
Fire apparatus, disinfectants, &c.....	200 00
Office furniture, Fort Myer.....	100 00
Total.....	1,500 00
Interment of officers and men.....	
Apprehension of deserters.....	\$200 00
	120 00
Transportation—	
Materials and funds.....	\$25,000 00
Officers and men.....	8,875 00
Means of, mules.....	1,000 00
Means of, harness.....	130 00
Means of, repairs to.....	500 00
Total.....	35,505 00
Barracks and quarters—	
Commutation of quarters.....	\$84,108 00
Work and supplies at Fort Myer.....	1,500 00
Work and supplies on hospital.....	300 00
Total.....	85,908 00
Clothing, camp, and garrison equipage—	
Six wall tents, &c.....	\$415 00
Issues in kind.....	4,960 00
Total.....	5,315 00
Medical Department:	
Medical attendance and medicines, officers and men, Signal Corps.....	\$5,000 00
Medical attendance and medicines, officers with Signal Corps..	100 00
Medical and hospital supplies, Fort Myer.....	700 00
Medicines from depots, &c.....	1,000 00
Material, repairs to hospital, Fort Myer.....	200 00
Total.....	7,000 00
Printing and binding allotted by the Secretary of War, about.....	\$40,000 00
Support of the Army:	
Expenses Signal Service, U. S. Army.....	\$5,000 00
Grand total.....	1,017,698 71

Many private persons, institutions of learning, etc., purchase their instruments through this office, because of the advantage afforded to obtain greater accuracy, by having the instruments compared with our standards, for which no extra charge is made. Of these there have been purchased two hundred and ninety-three instruments at a total cost of \$1,775.30.

## PROPERTY AND DISBURSEMENTS.

The improved methods of administering the duties of the Property and Disbursing Division of this office have continued, with gratifying results, and the accounts passed the scrutiny of the accounting officer of the Treasury with few suspensions, and these have been for mere technical informality. All vouchers are paid by checks drawn to order, and in no case to bearer; this mode being considered the safest, not



only in transmitting money, but it also furnishes the assurance that the money reaches the person for whom it is intended. All requisitions are carefully scrutinized, before payment, by an officer other than the Property and Disbursing Officer. The methods of verifying and settling accounts in this bureau are those prescribed by Army Regulations, and are identical with those which govern in the Quartermaster's Department of the Army, with the additional check that these accounts pass the scrutiny of the Examining Division of this office before they are submitted to the accounting officer of the Treasury.

The service has been economically managed, and the additional care of the property, which is widely distributed over the country, has greatly increased the work of the division. Under the present rule, each article purchased is taken up on a property report, which is rendered quarterly for transmission to the Third Auditor of the Treasury, so that there is not one article, from the merest trifle to the most expensive instrument that is purchased, but what is carefully reported to the accounting officer of the Treasury.

The experience of the past year furnishes additional reasons for renewing my recommendation for the erection of a fire-proof building for offices suitable for the uses of the Signal Service, as per plans and estimates contained in Senate Executive Document No. 152, 48th Congress, 1st session. The buildings now occupied by this service are insecure and unsafe for the storage of valuable Government property.

The annual report of Capt. S. M. Mills, Fifth Artillery, Property and Disbursing Officer, for the year ending June 30, 1885, will be found in Appendix No. 68, and the report of the Examining Officer for the same period is given in Appendix No. 69.

#### PUBLICATIONS.

The Monthly Weather Review of the Signal Service has been regularly published during the year, and with improvements and additions it now forms one of the most valuable productions of this Service. Each Review contains a general summary of the meteorological data collected by this office during the month. The introduction gives a brief statement of the weather conditions throughout the country, and the probable effect of the same upon the agricultural products of each section. The monthly means of temperature and rainfall, compared with the normal temperature and average rainfall for each district, are published in tabular form. Similar tables referring specially to the cotton region are given, based upon cotton-region reports. These tables are increasing in value from year to year, as they afford means of comparison between the meteorological conditions and their probable effect upon the crop.

A large number of marine reports are received in time to be utilized in tracing storms from the continent over the north Atlantic, and the probable tracks of these storms are given on the monthly charts accompanying the Review, thus affording information specially valuable to shipmasters.

The Monthly Summary and Review of International Meteorological Observations contains a summary of the reports published in the International Bulletin, and a general discussion of the meteorological conditions prevailing over the northern hemisphere. These observations have been published since 1873, and they furnish a valuable collection of data for the solution of the great problem of meteorology. With a view to economy I have discontinued the publication of the bulletin

and substituted a large daily chart, upon which the data is presented in graphic form.

The annual report of the officer in charge of the Fact and International Bulletin Division, in which these publications are prepared, will be found in Appendix No. 64.

Work has been continued on the publication known as the Meteorological Record, and by special authority of the Secretary of War arrangements have been made for the issue of this important work for a single year.

This publication contains a revised edition of the tri-daily bulletins and charts of this service, and affords a meteorological record of especial value in the study of storm movements within the United States. It is the most complete work now issued, and it is recommended that some provision be made for its regular publication.

The following Professional Papers of the Signal Service have been published during the year:

XIV. Charts of Relative Storm Frequency for a Portion of the Northern Hemisphere.—J. P. Finley, 2d Lieutenant, Signal Corps.

XV. Researches on Solar Heat and its Absorption by the Earth's Atmosphere.—Prof. S. P. Langley.

XVI. Toronado Studies for 1884.—J. P. Finley, 2d Lieutenant, Signal Corps.

The following Signal Service Notes have been published during the year:

XIII. The Relation between Magnetic Storms and Northers at Havana, Cuba.—G. E. Curtis, Sergeant, Signal Corps.

XIV. Physical Observations on Board the Lady Franklin Bay Expedition of 1883.—W. H. Lamar, jr., and F. W. Ellis, Sergeants, Signal Corps.

XV. River Floods and Danger Lines of 1882.—Prof. H. A. Hazen.

XVI. The Effects of Wind Currents on Rainfall.—G. E. Curtis, Sergeant, Signal Corps.

XVII. A First Report upon Observations of Atmospheric Electricity at Baltimore, Maryland.—Park Morrill, Private, Signal Corps.

XVIII. The Aurora in its Relation to Meteorology.—A. McAdie, Private, Signal Corps.

XIX. Report on the Tornado of August 28, 1884, near Huron, Dakota.—S. W. Glenn, Sergeant, Signal Corps.

XX. Report on Thunder-storms of May, 1884.—Prof. H. A. Hazen.

These publications are based upon the data collected by this office, and contain results which bear directly upon the current work of the service. It is therefore recommended that some provision be made for the continued publication of papers of this character.

Appendix No. 70 contains the report of the officer in charge of the Publications Division.

#### PERSONNEL.

The general work of the service is performed by twenty-one officers, three professors, three junior professors, five hundred enlisted men, and fourteen civilian clerks. Under the provisions of an act of Congress approved July 7, 1884, limiting the number of officers to be detailed from the line of the Army as acting signal officers, Lieutenants Caziarc, Ward, and Maus were relieved by S. O. No. 166, dated July 17, 1884, 2d Lieutenant B. M. Purcell, Signal Corps, U. S. A., was assigned to duty July 19th, relieving Lieutenant Caziarc, as officer in charge of Correspondence and Records Division; his report as officer in charge of

this division will be found in Appendix No. 64. 2d Lieutenant F. M. M. Beall, Signal Corps, U. S. A., was assigned to duty July 19th, relieving Lieutenant F. K. Ward, in charge of Stations Division.

Under the provisions of an act of Congress approved March 3, 1885, limiting the number of officers to be detailed from the line of the Army as acting signal officers, Lieutenant James Allen, an indication officer, was relieved from duty and ordered to his regiment by S. O. No. 142, dated June 23, 1885; Captain S. M. Mills and Lieutenant P. H. Ray were relieved from duty as acting signal officers, at their own request, on June 30th and June 20th, respectively.

Captain F. B. Jones, A. Q. M., was detailed by the Secretary of War as acting signal officer, and relieved Captain S. M. Mills of his duties as Property and Disbursing Officer of the Signal Service, July 1, 1885.

Sergeants James Mitchell and Frank W. Ellis were promoted to be 2d Lieutenants in the Signal Corps, to date August 15, 1885, after having passed a successful competitive examination.

The enlisted men of the service were distributed as follows: one hundred and sixty-two at the office of the Chief Signal Officer (since reduced to one hundred and fifty, and will be still further reduced); on telegraph lines, ninety-seven; at Fort Myer, thirty-three; and at Signal Service stations, two hundred and two, leaving six vacancies.

#### ORGANIZATION OF THE SIGNAL CORPS.

A completed organization for the Signal Corps is of the greatest importance. By retaining the experience of officers who have served for long periods in this service great economies can be secured each year, serious mistakes can be avoided, and excellence of service can be obtained in no other way.

The entire subject of reorganization of the Signal Corps is now in the hands of a joint commission of Congress that has thoroughly investigated it, and their report may be looked for at the meeting of Congress. This commission, with great patience, gave the fullest opportunity for the presentation of the views of the Chief Signal Officer, and he reasonably expects such recommendations to Congress as will result in permanence and great advantage to the service, in which he hopes for the concurrence and aid of the Honorable Secretary of War. The following extracts from the record of testimony before the commission show the need and kind of organization necessary, and wherein it is now deficient:

#### A FIXED ORGANIZATION.

The necessity of a fixed organization is the same as in any other military body. Without it the loss of experience by instructed officers leaving the service is a constant source of weakness, and loss in money as well as experience.

The saving of money where well-matured experience is applied in the disbursement of large sums (a million dollars a year in the Signal Service) bears about the same relation to its disbursements, when done by temporary details, as the building of a house with inexperienced mechanics does to building it with thoroughly trained men who know their business.

The saving by the legislation I have recommended, that is, by giving a permanent corps, would many times pay the cost of salaries, and in discipline and organization it is absolutely necessary. Now, when an officer is derelict and discipline becomes necessary, he asks to join his regiment, which is granted, and he is not only lost to my service, but an example of my want of power to enforce discipline is shown to those who remain.

The want of such a corps is felt every day and it is hoped that Congress will no longer withhold its benefits, leaving it alone, of all services in the Army, weakened

and embarrassed by the want of organization. This is one of the ways in which economy and efficiency can be secured by legislation, and the other, as refers to economy, is to build an office for the Signal Service, and the saving in rents will be greater than the value of the money it will cost.

A military organization is required because, to do our work, the military habit is necessary, that is, unquestioned obedience, promptness, and accurate methods of work. We must have this, and the military method is the only means ever devised by which this can be accomplished.

By other methods obedience and promptness are not so certain, and while we might get it in the majority of cases, yet there would be times when the continuity of our work would be destroyed by want of promptness, or disobedience of orders. When exact work is required, depending upon the absolute direction of others, it has been the custom of the world always to employ the military plan, and no other has ever been found so competent.

The Articles of War and Regulations of the Army add both to the vigor and efficiency of the Signal Service, and it is that fact alone which enables us to always be sure of getting prompt reports, enabling us to make our predictions in minutes, where the civil bureaux of Europe take hours, giving our bureau a prominence over all others.

These reasons of time, and the use of delicate instruments, require training and long practice, and especially the absolute dependence on specific time apply in such force to no civil, and no other military, bureau.

The necessity for grades of rank in every military organization has been recognized from time beyond record. It is the prime condition of their wholesome existence. These grades are all there is for the ambition of military men to look ahead to, it corresponds to the regular forward steps men look for in all walks of life; and without increased rank with age, a permanent military organization would have within it the conditions of its own infirmity and inferiority, and no good man would remain in it; at present, there is no promotion provided.

Our meteorological work all depends upon an accurate and continuous record. Without both of these conditions the work is valueless. To get these conditions, observers must be carefully trained, and must be held with an absolute control. This makes a military organization indispensable.

The gathering of these series is traditionally military work, and all that is of much value has been done under some form of military organization. Our own is the first in extent and value, and was begun about 1820, by the Medical Department of the Army. It has been kept up ever since, and fifty-two of the post hospitals still report to us, and give us valuable reports. The next in value is by the English ordnance. Then comes those of the religious orders, the monasteries, and they have what corresponds to a military control of the strictest kind, which has enabled them to secure unbroken series. But our own, by the Signal Service, in the past fifteen years, is unique, and of many times the value of all the other series combined.

There can be no doubt that there will be a loss of efficiency by a transfer. Efficiency is now as high as can be reasonably expected, and any change can but lower it, while to transfer the work will practically destroy the corps, as only its work, and not the men, can be transferred, leaving its future, at best, an experiment of very uncertain success.

The rules governing it are the development of fifteen years, are of a purely military nature, and will not suit a civilian organization. In fact, very much that we have done in the way of organization and plan, which has cost all these years of labor and money, and which has given such eminent satisfaction everywhere, will be lost. The country is satisfied and there is no call for its transfer.

The work is now done much more economically than it could be by a civil organization. It is a well-known fact that, except in the highest grades, military wages the world over are less than any other, and especially less than in the civil public service.

This is due largely, especially in republics, to a fixedness of service and removal from personal and political fluctuations.

We now pay \$65 and \$100 a month, when a like grade of men in civil employment, and who are less educated, receive \$100 and \$150. The latter figures would certainly rule in a civil service.

The chiefs of our offices in large cities are now most efficient, and do the work as sergeants, with the pay of, say, \$1,200 a year. Under civil service rule these places would certainly be magnified to correspond with chiefs of the other public offices by which the Signal Office is surrounded, until the pay would be three or four times as great as now.

The work of the men at Signal Service stations extends through seventeen hours of the twenty-four. This, while in the military service, counts as no extra time, and the men sleep between hours; in the civil service, under the law, it will count for more than two days, resulting finally in the employment of two men to do the work

now done by one. These are the sources of additional cost that can be foreseen, and there is no doubt but finally the cost of doing the same work now done, and which certainly will be continued, will cost double what it now does.

By the CHAIRMAN:

Q. This goes on through the entire year?

A. For three hundred and sixty-five days, Sundays and holidays. I do not know that this has come to the attention of the commission, but it is a very important factor.

There is no doubt but these two legal days, more than sixteen hours, would be, under a civil organization, a legal claim.

#### LEGISLATION NEEDED BY THE SIGNAL SERVICE.

To be added to the Signal Corps, with rank and pay of officers of like grade of cavalry—

1. One colonel.
2. One lieutenant-colonel.
3. One major and disbursing officer.

4. Eight captains; and the second lieutenants of the Signal Corps, after eight years of service as second lieutenants, may be appointed by the President first lieutenants; and after fourteen years' service as lieutenants, may be appointed by the President captains. And the one hundred and fifty sergeants of the Signal Corps shall be composed of three classes: twenty-five of the first class, who shall have the pay proper of \$50 a month; fifty of the second class, who shall have the pay proper of \$40 a month; and seventy-five of the third class, who shall have the pay proper of \$34 a month, the same as now. And all the sergeants, corporals, and privates of the first class shall be known as "Observers of the Signal Service."

I am, sir, very respectfully, your obedient servant,

W. B. HAZEN,  
*Brig. and Bvt. Maj. Gen'l,*  
*Chief Signal Officer, U. S. Army.*

Hon. WILLIAM C. ENDICOTT,  
*Secretary of War.*

10048 SIG—3



**LIST OF APPENDICES ACCOMPANYING THE REPORT OF THE CHIEF  
SIGNAL OFFICER OF THE ARMY FOR THE YEAR ENDING JUNE 30,  
1885.**

- 1.—Fort Myer, report of officer in charge.
  - 2.—Rules and regulations of the Indications Room.
  - 3.—Report of the officer in charge of the Pacific Coast Division of the Signal Service.
  - 4.—Summary of the work performed in the Stations Division.
  - 5.—Table showing the mean normal pressure, corrected for temperature and instrumental error only, at stations of the Signal Service, U. S. Army, for each month and the year, with monthly constants for the reduction to sea-level of barometric observations made at Signal Service stations. Compiled from January, 1880, to December, 1884, inclusive, except at stations opened subsequent to the former date. Obtained by dividing the sum of the 7 a. m., 3 and 11 p. m. (Washington time) normals by 3.
  - 6.—Table showing the mean of the highest pressure (reduced to sea-level) at stations of the Signal Service, U. S. Army, for each month of the year. Compiled from the commencement of observations at each station to, and including, December 31, 1881.
  - 7.—Table showing the mean of the lowest pressure (reduced to sea-level) at stations of the Signal Service, U. S. Army, for each month of the year. Compiled from the commencement of observations at each station to, and including, December 31, 1884.
  - 8.—Table of mean temperatures at stations of the Signal Service, U. S. Army, for each month and the year. Computed from the commencement of observations at each, to and including July, 1872. The daily means are obtained by dividing the sum of the 7.35 a. m., 4.35 and 11.35 p. m. (Washington time) observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month.
  - 9.—Table of mean temperatures at stations of the Signal Service, U. S. Army, for each month and the year. Computed from September, 1872, to, and including, October, 1879, except at stations opened subsequent to the former date. The daily means are obtained by dividing the sum of the 7.35 a. m., 4.35 and 11 p. m. (Washington time) observations by 3.
  - 10.—Table of mean temperatures at stations of the Signal Service, U. S. Army, for each month and the year. Computed from November, 1879, to December, 1884, both inclusive, except at stations opened subsequent to the former date. The daily means are those obtained by dividing the sum of the 7 a. m., 3 and 11 p. m. (Washington time) observations by 3.
  - 11.—Table showing the mean monthly temperature and departure of 1884 therefrom in degrees (Fahr.) at selected stations of the Signal Service, U. S. Army. This normal has been computed for the decade ending December 31, 1884. The daily means are obtained by dividing the sum of the three observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month.
- NOTE.—Observations from January 1, 1875, to November 1, 1879, taken at 7.35 a. m., 4.35 and 11 p. m. (Washington time), and from November 1, 1879, to December 31, 1884, at 7 a. m., 3 and 11 p. m. (Washington time).
- 12.—Table showing the annual and mean annual temperatures at stations of the Signal Service, U. S. Army. The daily means are obtained by dividing the sum of the three telegraphic observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month; the annual, by dividing the sum of the monthly by 12.
- NOTE.—Observations prior to August 25, 1872, were taken at 7.35 a. m., 4.35 and 11.35 p. m. (Washington time); from August 25, 1872, to November 1, 1879, at 7.35 a. m., 4.35 and 11 p. m. (Washington time); and from November 1, 1879, to December 31, 1884, at 7 a. m., 3 and 11 p. m. (Washington time).
- 13.—Table showing the mean daily range of temperature at stations of the Signal Service, U. S. Army, for each month of the year 1884. The daily range is the difference between the highest and lowest temperatures, as recorded on self-registering thermometers; the mean daily is obtained by dividing the sum of the daily by the number of days in the month.

- 14.—Table showing the highest temperature, and year in which it occurred, at stations of the Signal Service, U. S. Army, for each month and the year. Compiled from the commencement of observations at each, to, and including, December, 1884, from self-registering thermometers.
  - 15.—Table showing the lowest temperature, and year in which it occurred, at stations of the Signal Service, U. S. Army, for each month and the year. Compiled from the commencement of observations to, and including, December, 1884, from self-registering thermometers.
  - 16.—Table showing the monthly and annual mean temperatures from reports made by voluntary observers of the Signal Service, U. S. Army, for the year ending December 31, 1884. The daily mean is generally obtained by dividing the sum of the 7 a. m., 2, and twice the 9 p. m. (local time) observations by 4; the monthly, by dividing the sum of the daily by the number of days in the month.
  - 17.—Table showing the monthly maximum and minimum temperatures, and annual range of temperature, from reports made by voluntary observers of the Signal Service, U. S. Army, for the year ending December 31, 1884, from self-registering thermometers.
  - 18.—Table showing the monthly and annual mean temperatures at military post hospitals for the year ending December 31, 1884. The daily mean is obtained by dividing the sum of the 7 a. m., 2, and twice the 9 p. m. (local time) observations by 4; the monthly, by dividing the sum of the daily by the number of days in the month.
  - 19.—Table showing the monthly maximum and minimum temperatures, and annual range of temperature at military post hospitals, for the year ending December 31, 1884, from self-registering thermometers.
  - 20.—Table showing the monthly and annual mean temperatures at stations on the Central Pacific and Southern Pacific Railroads and connecting branches, for the year ending December 31, 1884. The daily mean is obtained by dividing the sum of the maximum and minimum temperatures by 2; the monthly, by dividing the sum of the daily by the number of days in the month.
  - 21.—Table showing the monthly maximum and minimum temperatures at stations on the Central Pacific and Southern Pacific Railroads and connecting branches, for the year ending December 31, 1884, from self-registering thermometers.
  - 22.—Table showing the mean of the maximum and minimum temperatures at the cotton-region stations of the Signal Service, U. S. Army, for the months of July to October, 1884, and May and June, 1885. These means are obtained by dividing the sums of the daily readings of self-registering thermometers by the number of observations taken—one daily at 5 p. m. (central time).
  - 23.—Table showing the mean temperature at 7 a. m., 3 and 11 p. m. (Washington time) at stations of the Signal Service, U. S. Army, for each month of the year. Computed from January 1, 1880, to December 31, 1884.
  - 24.—Table showing the mean a. m., p. m., and midnight temperatures at stations of the Signal Service, U. S. Army, for each month of the year. Computed from the commencement of observations to December 31, 1884.
- NOTE.—Observations prior to August 25, 1872, were taken at 7.35 a. m., 4.35 and 11.35 p. m. (Washington time); from August 25, 1872, to November 1, 1879, at 7.35 a. m., 4.35 and 11 p. m. (Washington time); and from November 1, 1879, to December 31, 1884, at 7 a. m., 3 and 11 p. m. (Washington time).
- 25.—Table showing the average temperature of the surface of the ocean at stations of the Signal Service, U. S. Army, on the Atlantic and Gulf coasts, for each month and the year. Computed from observations taken at 2 p. m. (Washington time), daily, from the date observations began to December 31, 1884.
  - 26.—Table showing the mean temperature and average precipitation, the latter in inches and hundredths, at stations of the Signal Service, U. S. Army, for each season of the year. Computed from the commencement of observations at each to, and including, December, 1884. The mean temperature is deduced from three telegraphic observations taken at the same moment of Washington time at all stations. The seasons comprise the following months: Spring—March, April, and May. Summer—June, July, and August. Autumn—September, October, November. Winter—December, January, and February.
- NOTE.—Observations prior to August 25, 1872, were taken at 7.35 a. m., 4.35 and 11.35 p. m. (Washington time); from August 25, 1872, to November 1, 1879, at 7.35 a. m., 4.35 and 11 p. m. (Washington time); and from November 1, 1879, to December 31, 1884, at 7 a. m., 3 and 11 p. m. (Washington time).
- 27.—Table showing the normal precipitation and departure (of 1884) therefrom, in inches and hundredths, at stations of the Signal Service, U. S. Army, for each month of the year. The normal has been computed from the commencement of observations to December, 1884, inclusive.
  - 28.—Table showing the average precipitation, in inches and hundredths, at selected stations of the Signal Service, U. S. Army, for each month and the year. Computed for the decade ending December 31, 1884.



- 29.—Table showing the average precipitation, in inches and hundredths, at selected stations of the Signal Service, U. S. Army, for each month and the year. Computed from January, 1880, to, and including, December, 1884.
- 30.—Table showing the annual and mean annual precipitation, in inches and hundredths, at stations of the Signal Service, U. S. Army. Compiled from the commencement of observations to 1884, inclusive.
- 31.—Table showing the monthly and annual precipitation, in inches and hundredths, from reports made by voluntary observers of the Signal Service, U. S. Army, for the year ending December 31, 1884.
- 32.—Table showing the monthly and annual precipitation, in inches and hundredths, at military post hospitals, for the year ending December 31, 1884.
- 33.—Table showing the monthly and annual precipitation, in inches and hundredths, at stations on the Central Pacific and Southern Pacific Railroads and connecting branches for the year ending December 31, 1884. (Copied from the records on file at the office of the chief engineer, C. P. R. R.)
- 34.—Table showing the precipitation, in inches and hundredths, at the cotton-region stations of the Signal Service, U. S. Army, for the months of July to October, 1884, inclusive, and May and June, 1885.
- 35.—Table of mean relative humidity at stations of the Signal Service, U. S. Army, for each month and the year. Computed from the commencement of observations at each to, and including, July, 1872. The daily means are obtained by dividing the sum of the 7.35 a. m., 4.35 and 11.35 p. m. (Washington time) observations by 3.
- 36.—Table of mean relative humidity at stations of the Signal Service, U. S. Army, for each month and the year. Computed from September, 1872, to, and including, October, 1879, except at stations opened subsequent to the former date. The daily means are obtained by dividing the sum of the 7.35 a. m., 4.35 and 11 p. m. (Washington time) observations by 3.
- 37.—Table of mean relative humidity at stations of the Signal Service, U. S. Army, for each month and the year. Computed from November, 1879, to December, 1884, both inclusive, except at stations opened subsequent to the former date. The daily means are obtained by dividing the sum of the 7 a. m., 3 and 11 p. m. (Washington time) observations by 3.
- 38.—Table of mean relative humidity at stations of the Signal Service, U. S. Army, for each month and the year. Computed from the 7 a. m., 3 and 11 p. m. (Washington time) observations, and from January 1, 1882, to December 31, 1884.
- 39.—Table showing the average dew-point at stations of the Signal Service, U. S. Army, for each month and the year. Compiled from January, 1882, to, and including, December, 1884. The daily means are obtained by dividing the sum of the 7 a. m., 3 and 11 p. m. (Washington time) observations by 3.
- 40.—Table showing the date of the first light frost at stations of the Signal Service, U. S. Army, east of the Rocky Mountains, for the winter of 1884-'85.
- 41.—Tables showing the dates of the first killing frost at stations of the Signal Service, U. S. Army, east of the Rocky Mountains, for each winter from 1873-'74 to the winter of 1884-'85, inclusive.
- 42.—Table showing the date of the last light frost at stations of the Signal Service, U. S. Army, east of the Rocky Mountains, for the winter of 1884-'85.
- 43.—Table showing the date of the last killing frost at stations of the Signal Service, U. S. Army, east of the Rocky Mountains, for each winter from the commencement of observations to, and including, the winter of 1884-'85.
- 44.—Table showing the date of the first snowfall at stations of the Signal Service, U. S. Army, east of the Rocky Mountains, for the winter of 1884-'85.
- 45.—Table showing the date of the last snowfall at stations of the Signal Service, U. S. Army, east of the Rocky Mountains, for the winter of 1884-'85.
- 46.—Table showing the average movement of the wind, in miles, at stations of the Signal Service, U. S. Army, for each month and the year. Compiled from the commencement of observations at each to, and including, December, 1884.
- 47.—Table showing the average hourly velocity of the wind, in miles, at stations of the Signal Service, U. S. Army, for each month and the year. Computed from the commencement of observations at each to, and including, December, 1884. The average hourly velocity is obtained by dividing the average monthly movement by the number of days in the month, and the result by 24.
- 48.—Table showing the average cloudiness (scale of 0 to 10) at stations of the Signal Service, U. S. Army, for each month and the year. Compiled from the commencement of observations at each to, and including, December, 1884, from the three telegraphic observations. The monthly average is obtained by dividing the sums of the amount of cloudiness recorded daily by the number of observations taken.

- 49.—Table showing the average number of clear, fair, and cloudy days at stations of the Signal Service, U. S. Army, for each month and the year. Compiled from the commencement of observations at each to, and including, December, 1884, from the three telegraphic observations. Cloudiness is recorded on a scale of 0 to 10, each observation. Clear days comprise from 0 to 8 tenths; fair, 9 to 22; and cloudy, 23 to 30.
- 50.—Directions from which the prevailing winds have been observed to blow at stations on the Central Pacific and Southern Pacific Railroads and connecting branches, during each month of the year 1884. (Copied from the records on file at the office of the chief engineer, C. P. R. R.)
- 51.—Directions from which the prevailing winds have been observed to blow at stations of the Signal Service, U. S. Army, during each month of the year. Computed from the commencement of observations at each to, and including, December, 1884.
- 52.—Annual meteorological summaries (Forms 127 B) at stations of the Signal Service, U. S. Army.
- 53.—Description of the various districts shown on the Signal Service district map.
- 54.—Report of the display of cold-wave signals.
- 55.—Report upon the temperature and weather signals.
- 56.—Railway weather bulletin service.
- 57.—River reports and flood warnings.
- 58.—System of cotton-region reports.
- 59.—Classified list of stations of the Signal Service.
- 60.—Report of the display of cautionary signals at special stations.
- 61.—List of stations of the first and second order, established since November 1, 1870, together with the dates on which those not in operation on June 30, 1885, were closed.
- 62.—Signal Service agencies.
- 63.—Report of officer in charge of telegraph lines.
- 64.—Report of officer in charge of Correspondence and Records Division.
- 65.—Report of officer in charge of Fact and International Bulletin Division.
- 66.—Report of assistant in charge of the Study Room Division.
- 67.—Report of assistant in charge of Physical Laboratory.
- 68.—Report of the Property and Disbursing Officer.
- 69.—Report of officer in charge of Examiner's Division.
- 70.—Report of officer in charge of Publications Division.
- 71.—Meteorological Researches, Prof. William Ferrel.

## APPENDIX I.

## REPORT OF OFFICER IN CHARGE OF FORT MYER.

FORT MYER, VIRGINIA, July 10, 1885.

**GENERAL:** I have the honor to submit my annual report of the school of instruction and post of Fort Myer for the fiscal year ending June 30, 1885.

The course of instruction as prescribed for officers and enlisted men has been closely followed.

Five officers of the Signal Corps reported during the year for instruction, namely, Lieuts. Frank Greene, J. H. Weber, J. P. Finley, J. E. Maxfield, and F. R. Day. Lieutenant Weber was relieved from duty November 8, 1884, without completing his course, and granted sick leave. The remaining four officers completed the full course and passed the final examination.

Lieutenants Walshe, Finley, and Day were ordered on inspection duty February 27, 1885, and returned to duty at this post on the following dates: Lieutenant Finley, May 20, Lieutenant Day, May 31, and Lieutenant Walshe, June 2.

Lieutenant Day was relieved from duty at this post June 1, 1885, and ordered to report at the office of the Chief Signal Officer.

At the commencement of the fiscal year, July 1, 1884, there were 13 enlisted men under instruction; of this number, 2 (privates Flynn and Frazee) were discharged for misconduct, 1 (Private Hill) deserted, and 1 (Private Brown) failed on final examination and was discharged. The remainder completed the full course and passed.

Thirty-nine enlisted men reported for instruction during the year; of this number 31 completed the full prescribed course and passed, 2 (Privates Davis and Sues) failed on final examination, 5 (Privates Laughlin, Wyman, Welch, Hoffman, and Chapman) were discharged before completion of course on account of incompetency, and 1 (Private Keenan) died of consumption.

Lieutenants Greene, Walshe, and Maxfield have assisted in the instruction department during the year. The prescribed course of lectures for enlisted men were delivered by Lieutenant Maxfield.

Instruction in military signalling by flag and torch, heliograph, homographic and international code, and in electricity and practical telegraphy, was given during the year to officers and enlisted men. A ten days' course in Mendall's military surveying was given to the class of officers, which consisted of rough sketches taken in the field.

Owing to the want of horses for the proper equipment of the field telegraph train, all drills and instruction in the use of this important feature of the corps in time of war could not be carried on. It is hoped that the time is not far distant when this matter will receive from Congress the consideration it deserves, that the necessary means may be provided which will enable the Chief Signal Officer to keep pace with other countries in this method of communicating with the different commanders of the army while in battle.

## POST ADMINISTRATION.

Improvements of the post have been carried on during the year as mapped out by the Chief Signal Officer, and the results have been highly satisfactory, the most important being the grading and graveling of the road from the cemetery to the Aqueduct bridge, guttering with cobble-stone, trimming out and grubbing along the road-sides. A gravel walk has been put down leading to the laundress' quarters, a new road opened in rear of the quartermaster's storehouse, and the grounds on the north and west of this building have been graded, top dressed, and ready for grass seed in the fall.

The saw-mill, an unsightly building, standing near the west end of the quartermaster's storehouse, has been moved to a more suitable place. A great amount of grubbing and cleaning up has been done during the year in the field inclosed with the wire fence. The woods lying south of the post, and extending to the cemetery wall, is now being cleared up by grubbing, leaving a clear view of the city and Arlington Heights.

Water-closets, with ample sewerage, have been constructed at the hospital, instruction building, and laundress' quarters, and adds greatly to the sanitary condition of the post. The old privies, with wood troughs, heretofore in use, have been torn down. A good system of surface drainage has been put down for draining the cellars of the officers' quarters and the stables and corral yard.

As the improvements inaugurated by the Chief Signal Officer have progressed the numerous mud-holes heretofore visible have been entirely obliterated. A thorough police of the post has been rigidly maintained, and its sanitary condition is good. Orders of the Chief Signal Officer require a weekly inspection of the post by the medical officer, with a view of ascertaining its sanitary condition, and all recommendations of this officer are promptly carried out.

The old and defective water-closets in the officers' quarters have been replaced by the Demorest patent with flushing tanks. This insures an ample supply of water, and thoroughly flushes the closets and soil pipes. This was impossible while the old style of closets was kept in use in these buildings. The bad odors and gases heretofore so noticeable have now been obviated.

The full quota of men for the permanent party has been obtained and comprises a good steady working force. The non-commissioned officers have well performed all duties assigned them. It is hoped steps may be taken to insure extra-duty pay for the mechanics and laborers of this force, which they so much need and deserve.

I am, general, very respectfully, your obedient servant,

JAMES A. SWIFT,

*Second Lieutenant Signal Corps, U. S. Army, in charge.*

To the CHIEF SIGNAL OFFICER, U. S. A.,  
*Washington, D. C.*

## APPENDIX 2.

## RULES AND REGULATIONS OF THE INDICATIONS ROOM.

INSTRUCTIONS }  
No. 22. }SIGNAL OFFICE, WAR DEPARTMENT,  
Washington, April 22, 1885.

I. Paragraphs 100 to 222b, inclusive, Office Regulations, 1883, are annulled.

II. The following compendium of rules and regulations relating to the indications division is published for the information and guidance of those concerned.

1. The indications officer will have charge of the division for the preparation of synopses and indications, which will be designated as the indications division; he will carefully scrutinize the charts and latest reports, and call the especial attention of the indications board to all meteorological conditions requiring attention under the regulations; and will at all times keep himself informed of all regulations referring to indications.

*A.—For the guidance of the officer in charge.*

2. He will be at the office at 9 a. m., 12 m., 5 p. m., and 12 midnight each day.

3. He will examine the reports carefully to discover telegraphic errors; note all such errors and call upon the telegraph division for corrections when they are necessary and can be obtained.

4. He is strictly required to draw his own isobars and isotherms upon the weather chart (No. 1) used in preparing the synopsis and indications.

5. He will verify or correct the manifold copy of the synopsis and indications, seeing that the text is clear and legible, and will attach his name to it. He will also see, so far as it may be in his power, that they are given the widest publication where they are useful. He will take such efficient steps as will insure the speediest delivery of the indications, bulletins, and charts to the press and post-office, and his responsibility and duties will only end when this is done. (Ins. 69, 1884.)

6. A single copy of the synopsis for the a. m. report will be sent to the publications division by 9.26 a. m., the complete synopsis and indications not later than 9.49 a. m., the morning special bulletin at 9.52 a. m., and the indications for the midnight report at 12.45 a. m. (Ins. 140, 1884.)

7. He will call for special telegraphic observations to be taken at such stations, and at such times as he may consider necessary. When river reports are to be discontinued he will notify the officer in charge of the stations division, who will issue the necessary orders. (Ins. 74, 1884.)

8. For the morning weather chart he will make tracings of the isobars, isotherms, and storm-tracks from the original charts of the 7 a. m. report as soon as practicable, preferably before the completion of the indications. These tracings will be sent to the lithographing room by or before 9.26 a. m., daily. He will give close attention to the morning weather chart until it has been actually completed, seeing that all through its several stages the work is correctly done and leaving no chance for errors. For this purpose he will visit the printing room, and inspect the chart when it is first struck off, and verify it before allowing the edition to be printed. (Ins. 140, 1884.)

9. He will compare each tri-daily indications of the previous day with the conditions exhibited in the three succeeding weather charts.

10. He will particularly notice, in connection with the study of charts, the rain and dry-wind charts, the charts and tables of normal temperatures and normal barometric pressures and the barometric oscillations for the several stations, the charts exhibiting average direction of translation of low barometers (storm-tracks), the Monthly Weather Review and its charts, and the file of tri-daily charts and prevailing wind-directions. These charts should be examined in reference to the corresponding month of preceding years, and to the months preceding and succeeding. Particular attention should be given to the study of the cloud areas and of dew-points as affecting probable changes of night temperature.

11. On the day of assignment to duty in charge of the indications division he will carefully examine all instructions pertaining to that division.

12. He will see that the mounted messenger is present, with horse saddled, at the moment the indications are ready, and that he starts immediately at a rapid pace; and failing in this, in any particular, he will report the fact in writing. (G. O. 28, 1873; Ins. 29, 1876.)

13. A messenger will report to him each morning at 9 o'clock in the indications room, and continue under his orders until after the completion of the morning duties. (Ins. 192, 1881.)

14. As without sleep in the daytime, the fatigue caused by this duty is too great to permit its best discharge, officers on that duty are recommended to sleep in the afternoon. (Cir. 5, 1874.)

15. Officers on duty in the indications division are excused, during the time of their tour, from the continuous night-watch, as noted in paragraph 3, page 80, General Regulations, 1885, but may be required to remain at the office to announce the progress of storms or other facts connected with their especial duty when such announcements are needed. (Ins. 14, 1878.)

16. Before taking charge of indications division, the officer assigned will report to the Chief Signal Officer for instructions. (Ins. 13, 1884.)

17. Form 434 (check-slip for indications officer) will be carefully examined by the indications officer at each report, and as each item of the report is completed it will be successively checked. The check-slips will be sent with the record book of the indications board to the Chief Signal Officer before 12 m. daily, except Sunday. (Ins. 69, 1884.)

18. Action upon telegrams requesting special weather indications will be taken at once by the officer in charge of the indications division. (Ins. 111, 1884.)

#### PRESS REPORTS.

19. In preparing press reports (Form 109a) when the indications are completed for any district, its name in the margin of the report will be checked with a cross (thus +). When the indications are intentionally omitted for any district its name will be checked with a zero (thus 0).

20. For the press dispatch, the officer in charge will endeavor to get out the morning synopsis and indications at 9.49 a. m.; the special bulletin at 9.52 a. m., and the midnight indications at 12.45 a. m. (Ins. 140, 1884.)

21. One file of the manifold press reports will be kept in the division.

22. The list of addresses for the distribution of the press reports and special bulletins will be posted in the indications division and kept corrected to date. (L. R. 6679, Mis., 1884.)

#### CHARTS.

23. The following designation is adopted for indications-division charts, and will be written in blue pencil on the right-hand lower corner of each leaf, in each monthly book of tri-daily charts together with the name of the officer in charge of indications, and the date and number of the tri-daily chart. The 7 a. m., 3 p. m., and 11 p. m. charts being numbered "i," "ii," and "iii," respectively: Chart 1, weather; Chart 2, barometric changes; Chart 3, barometric departures and abnormal variations; Chart 4, temperature changes; Chart 5, temperature departures and abnormal variations; Chart 6, clouds; Chart 7, dew-points. (Ins. 53, 1881.)

24. In the preparation of these charts, pencils of different colors, as prescribed, will be used. When not otherwise stated, the ordinary black lead pencil is intended. If possible, all lines traced on these charts will be extended across the continent.

25. Charts 1 to 6, inclusive, for May 1, 1881, and Chart 7, for July 1, 1881, will be followed as models. No change will be made in any of these charts without the written authority of the Chief Signal Officer. (Ins. 53, 1881.)

26. Each officer in turning over the charge of the indications division to his successor will see that the charts are completed to the date of relief. (Ins. 40, 1877.)

27. All telegraphic reports received by mail on account of being delayed at stations or at transfer offices, from any cause, will, as soon as they arrive, be translated and entered on the indications charts. (Ins. 16, 1884.)

28. On all charts, data received too late for use in current indications will be entered in blue; in such instances, the amount of precipitation, if any, will be underscored in red.

29. Chart corrections to reports will be given in blue by the side of the corresponding erroneous data, through which a blue line will be traced.

#### CHART No. 1.

30. Chart 1 will show for each station: (1) temperature; (2) barometer (reduced to sea-level); (3) wind velocity, and when reported, the maximum velocity since last regular report; (4) amount of rainfall (or melted snow); (5) state of weather; (6) wind direction; (7) ocean swell at certain sea-coast stations.

31. Isotherms, with their proper figures, will be drawn in blue for each ten degrees of temperature, in full lines; when doubtful, in broken lines.

32. Isobars, with their figures, will be drawn in red for each tenth of an inch of atmospheric pressure, in full lines; when doubtful, in broken lines. The words "high" or "low" will be so placed as to show the relative barometric condition of the regions marked.

33. The wind velocity will be entered as received, in miles per hour if registered; if estimated, by writing "calm," "light," "high," &c., as the case may be. Maximum wind velocities, when reported, will be entered in parenthesis to the right of the current velocity.

34. The amount of precipitation for the eight hours preceding the report, if any, will be entered in inches, tenths, and hundredths, underscored in blue; if inappreciable, a short horizontal line will be drawn, underscored by a similar line in blue. The absence of precipitation will be shown by the figures 00.

35. The direction of the wind will be shown by an arrow, flying with the wind, drawn through the center of the station circle.

36. The state of the weather at the time of the report will be shown thus: Cloudy or fair by circles fully or one-half shaded; heavy rain by "R."; light rain by "r."; heavy show by "S."; light snow by "s."; threatening by "T."; clearing by "C."; foggy by "f."; hazy by "z."; smoky by "sm."; sleeting by "slt."; written within the circle. A thunder-storm will be indicated by a short horizontal line in red, within and at the bottom of the circle. Frost will be written in full near the circle and will be underscored in red, prefixed by "K." or "L." to denote killing or light, respectively.

37. The ocean swell from sea-coast stations will show the direction from which it comes and its character as heavy or light, thus: Heavy northeast swell by writing by the side of the station, "Hy. NE." or light south, thus: "Lt. S."

38. The appropriate data from river and other stations not reporting tri-daily will be entered, and on the margin of the 3 p. m. chart the 11 a. m. reports from stations specially called for, noting also the hour of observation.

39. The absence of data for temperature, barometer, wind velocity, weather, and sea swell will be shown by a short horizontal line in the space specified for the data itself.

40. The absence of data for precipitation will be shown by writing in its place "blk." Such absences will also be noted on the margin of the chart.

41. Data of doubtful accuracy will be questioned thus "?", and by a note on the margin of the chart; marginal notes will always be in blue.

42. When a station is reported as missing, the fact will be indicated by drawing a short blue line within the circle.

#### CHART No. 2.

43. Chart 2, barometric changes, requires the following definitions of the terms used:

An actual barometer is the barometer reading corrected for temperature and instrumental error only.

A reduced barometer is the barometer reading corrected for temperature, instrumental error, and gravity, and reduced to sea-level.

A normal barometer is the mean of actual barometers.

A barometric departure is the difference between the mean barometer for the month and hour of the report and the barometer for a given report.

Abnormal variations in barometer are changes different from the mean hourly changes.

44. On Chart 2 enter within the circle the reduced barometer from regular stations throughout the United States and the actual barometer from Canadian stations for current report; above the barometer and within the circle enter the difference between the current barometer and that of the previous report, prefixed by the sign + if the current reading be higher, and the sign -, if lower. In a similar manner enter the difference between the current barometer and that of the previous twenty-four hours, with proper sign prefixed, within the circle and below the current barometer.

45. Lines in blue will show each tenth of an inch of change in barometer during the past eight hours, with the amount of change in figures, with the sign + to show a rise, and the sign - to show a fall.

46. In a similar way lines in red will be drawn to show each tenth of an inch of change in pressure in twenty-four hours, with corresponding signs and figures.

47. There will also be drawn in blue and red, of double weight, lines to show no change in barometer for eight and for twenty-four hours, respectively, with the sign + and -, each on its appropriate side.

48. A list of corrections will be prepared to be applied to the barometer reports of the first day of each month, so as to exhibit the true changes in actual barometer; these corrections, with proper algebraic signs prefixed, will be written without the circle, and will be applied to the eight and twenty-four hour changes of first report and to the twenty-four hour changes of second and third reports.

## CHART No. 2.

49. In connection with Chart 3, barometric departures and abnormal variations, are prepared three auxiliary charts, to show for each station the mean barometer for each tri-daily telegraphic report of the current month; this mean barometer is obtained by adding to the normal barometer for the month and hour of report the monthly constant. The frequency of the wind-direction for the month (including calms) at the several stations, will be shown on these auxiliary charts by arrows flying with the wind, not more than three directions being given. The order of relative frequency will be shown by blue, red, and yellow arrows, respectively. The prevalence of calms will be indicated by drawing a circumference around the circle of station of the proper color, to show the order of relative frequency; also on these auxiliary charts isobars will be drawn in red to show each tenth of inch of mean reduced pressure as determined for each of the tri-daily reports of the month. At the end of the month these charts will be pasted in the back of the book.

50. On Chart 3 enter within the circle for each station the current departure, which is the difference between the current barometer and the mean barometer for the month and hour of report, as entered on the auxiliary charts above referred to. This departure is affected by the sign + if the current barometer be higher than the mean barometer, and with the sign — if it be lower.

51. Compare each departure with the departure of the same station for preceding report, place the difference without the circle, and, if practicable, immediately to the right. This difference, which is the abnormal barometric variation, has the sign + if the current departure is algebraically greater than the preceding, and the sign — if less.

52. Lines in carbon will be drawn to show each tenth of an inch of departure, the amount of such departure in figures, with proper sign prefixed.

53. A carbon line of double weight will show the mean pressure, *i. e.*, be drawn between the + and — departures, with the signs + and —, each on its appropriate side.

54. Lines in blue will be drawn to show each tenth of an inch of abnormal variation in barometer during past eight hours, with amount of change in figures, with the sign + to denote an abnormal increase, and the sign — to denote an abnormal decrease of pressure.

55. A line in blue, of double weight, will show where the variation is normal, *i. e.*, be drawn between the + and — variations, with the signs + and —, each on its appropriate side.

56. On this chart will also be entered the direction of the wind as explained for Chart 1.

## CHART No. 4.

57. Chart 4, temperature changes, requires the following definitions:

Actual temperature is the temperature observed, corrected for instrumental error only.

A normal temperature is the mean of actual temperatures.

A temperature departure is the difference between the normal temperature and the actual temperature for a given report.

Abnormal variations in temperature are changes different from the mean hourly changes.

58. On Chart 4, enter within the circle the actual temperature of the current report; above the actual temperature, and within the circle, enter the difference between the current actual temperature and that of the previous report, prefixed by the sign + if the current reading be higher, and the sign — if lower. In a similar manner the difference between the current temperature and that of the report twenty-four hours previous will be entered, with the proper sign prefixed, within the circle and below the actual temperature.

59. Lines in blue will be drawn to show each ten degrees change in temperature during the past eight hours, with the amount of changes in figures, with the sign + to denote a rise, and the sign — a fall.

60. Similar lines in red will be drawn to show each ten degrees of change in temperature during the past twenty-four hours, with figures and signs.

61. There will also be drawn, in blue and red, respectively, lines of double weight to show lines of no change in temperature for eight and twenty-four hours, with the signs + and —, each on its appropriate side.

## CHART No. 5.

62. In connection with Chart 5, temperature departures and abnormal variations, three auxiliary charts are used, which show for each station the normal temperature for each tri-daily telegraphic report for the current month. Isotherms will be drawn



on these charts in blue, to show each ten degrees of normal temperature. At the end of the month, these charts will be pasted in the back of the book.

63. On Chart 5 enter within the circle for each station the current departure, *i. e.*, the difference between the current actual temperature and the normal temperature for the month and hour of report, as shown on the auxiliary charts.

64. This departure is prefixed by the sign + if the current actual temperature be higher than the normal, and with the sign —, if lower.

65. Compare each departure with the departure of the same station for the preceding report, place the difference without the circle, and, if practicable, immediately to the right.

66. This difference, which is the abnormal variation in temperature, has the sign + when the current departure is algebraically greater than the preceding, and the sign — when less.

67. Lines in carbon will be traced to show each ten degrees of departure, with the value in figures, and the proper sign prefixed.

68. A carbon line of double weight will show the normal temperatures, *i. e.*, be drawn between the + and — departures, with the signs + and — each on its appropriate side.

69. In a similar manner, lines in blue will be drawn, to show each five degrees of abnormal variation of temperature during the past eight hours, with figures, and the sign + to show an abnormal rise, or the sign — to show an abnormal fall in temperature.

70. A blue line of double weight will be drawn through points of no variation, with the signs + and — each on its appropriate side.

#### CHART NO. 6.

71. On Chart 6 show by the Signal Service cloud symbols the cloud conditions prevailing over the country: For the upper clouds, red, placed above the circle; for the lower clouds, blue, placed below the circle.

72. The area of complete cloudiness will be inclosed by a green line and marked  $\ddagger$ .

73. The direction of movement of the clouds will be shown by an arrow of the color used for the clouds.

74. The stations at which precipitation has fallen since the previous report, and is not falling at the time of report, will be marked within, or near the circle, by a blue cross, thus  $\times$ . The cross will be omitted from stations from which clouds are not required to be sent.

75. Dense haze or smoke will be shown, respectively, by writing within or near the circle "Z" or "SM," and light haze or smoke by "z" or "sm," in red or blue, as the conditions belong to upper or lower clouds.

76. Dense fog will be shown by writing, in blue, "F," within or near the circle, and light fog by "f."

77. On the 7 a. m. chart, will be entered within the circle, the minimum temperature.

78. Isotherms in blue will be drawn, for each ten degrees of minimum temperature, as explained in Chart 1.

79. Temperatures will be compared with temperatures of the same stations for the preceding day, and the difference, prefixed by the signs + or —, to show respectively a rise or fall, will be placed immediately without the circle, and, if practicable, to the right.

80. A line of double weight in red will be traced between the + and — differences to indicate no change in minimum temperature in one day, with the signs + and —, each on its appropriate side.

81. From May 1 to September 30, on the 3 p. m. chart, will be entered within the circle, the maximum temperature. Isotherms in blue will show each ten degrees of maximum temperature. These temperatures will be compared with those of the same stations for the preceding day, and the difference, and sign, will be placed as required in the case of minimum temperatures.

82. A line of double weight, with proper signs in red, will show no change in maximum temperatures in twenty-four hours.

83. On the 11 p. m. chart, the character of the sunset will be shown by Signal Service symbols, *i. e.*, by a vertical tangent, equal in length to the diameter of the circle, and drawn on the west side, in different colors, as follows, viz: Fair, by red; foul, by blue; green, by green; yellow, by yellow. Doubtful sunsets will be shown by an interrogation mark in blue on the west side of the circle.

84. When auroras or halos are reported from stations they will be shown on this chart by a circle drawn within the station circle; auroras in red, halos in blue.

85. Chart No. 7 will show within the circle the temperature of the dew-point—thus,  $\odot$ ; without the circle, and if practicable, immediately to the right, the temperature of the air and the depression of the dew-point below the temperature of the

air—thus, Off. The temperature of the air will be omitted from stations from which the dew-point is not required to be sent.

86. Lines in red, with proper figures, will show each 5° of equal depression of the dew-point. A line in blue will show the dew-point line of 32°.

#### B.—Duties of clerks.

87. The clerical force of this division will be divided into three reliefs. The first relief from 8 a. m. until 11.30 a. m. The second relief from 3.30 p. m., until relieved by the officer in charge. The third relief from 11.30 p. m., until relieved by the officer in charge.

88. The sergeant, or other enlisted man, in charge of the stations division relief on duty will, during the translation, in the absence of a commissioned officer, be responsible for the discipline in the indications room, and his orders will be promptly obeyed by all men in the room.

89. The clerks will be designated as 1, 2, 3, 4, 5, and 6, with division of duty, in regular detail, as follows:

	A. M.	P. M.	Midnight
Clerk 1.....	Chart 1.....	Charts 6 and 7.....	Charts 6 and 7.
Clerk 2.....	Chart 1.....	Chart 1.....	Chart 1.
Clerk 3.....	Charts 6 and 7.....	Charts 2 and 3.....	Charts 4 and 5.
Clerk 4.....	Charts 2 and 3.....	Charts 4 and 5.....	Charts 2 and 3.
Clerk 5.....	Charts 4 and 5.....		
Clerk 6.....			

90. On the 5th day of each month, at the 3 p. m. report, each clerk will assume the duties of the next succeeding number as indicated above, except that 6 will be assigned to the duties of 1.

91. The clerk charged with the preparation of Chart 1 of each report will write the synopsis and indications, prepare all signal orders and special telegrams, and adjust the cautionary-signal board from the signal orders as these orders are read by the assistant in charge. (Ins. 49, 1877.)

92. Each clerk will write his initials in the lower right-hand corner of the chart prepared by him, and he will be held responsible for the correctness and completion of such chart. In case of delay in the receipt of data, he will complete the lines at the first opportunity after the receipt of such data. The clerk entering late data will at the same time enter the eight and twenty-four hour changes. (L. R. 6679, Mis., 1884.)

#### C.—Preparation of synopsis, indications, special bulletin, &c.

##### THE SYNOPSIS.

93. The following statements, briefly made, are essential to the "synopsis:"

The regions of highest and lowest barometer, and, if within the limits of the chart, the location and path of the storm-center; in special cases, the direction of movement of high barometers; for the several meteorological districts—the weather, the temperature, and the wind-direction; special temperatures whenever 15°, or more, above or below the normal; heavy rainfalls in past twenty-four hours at selected stations; and the rise and fall of rivers. (G. O. 28, 1873; Ins. 3, 1881; Ins. 69, 1884.)

##### THE INDICATIONS.

94. The following statements, briefly made, are essential to the "indications:"

For the ensuing twenty-four hours, from the time of observation, in the several geographical districts, the expected condition of weather, wind, temperature, and barometer; anticipated frosts and freezing weather as far in advance as possible; changes anticipated in the rise and fall of rivers; and, at the end, the stations, or when the display is general, the regions, where storm-signals are displayed. (G. O. 28, 1873; Ins. 13, 1877; Ins. 46, 1881; Ins. 69 and 131, 1884.)

95. New forms of expression are forbidden until approved by the Chief Signal Officer.

96. When practicable, use the word veering when the wind changes direction with the hands of a watch, and backing when it changes contrariwise.

97. When practicable, follow the geographical districts in the order shown on Form 109a; and when the weather reports justify such minuteness, name individual States, Territories, lakes, &c.

98. The use of the words or, mostly, probably, possibly, and pressure is prohibited in all predictions. (Mem., Dec. 13, 1883.)

99. Districts will not be grouped together, but predictions will be made for each district separately, except when the same prediction can be applied to two or more districts. (Mem., Dec. 13, 1883.)

100. Indications of changes in the barometer will be made only when marked or decided changes are likely to occur.

101. Predictions will be made for the following districts, States, and localities: At 7 a. m., 3 p. m., and 11 p. m., for New England, the Middle Atlantic States, the South Atlantic States, the East Gulf States, the West Gulf States, the Ohio Valley and Tennessee, the lower lake region, the upper lake region, the Upper Mississippi Valley, and the Missouri Valley; at 11 p. m., for Colorado, Kansas, and Indian Territory, New England (special), Pennsylvania and Maryland, Northern Alabama, Ohio, the vicinity of New York and Philadelphia, the vicinity of Baltimore and Washington, the vicinity of Albany, and Southern Virginia; at 7 a. m., for New England (special), and for Omaha and vicinity; and such other special predictions as may be ordered from time to time by the Chief Signal Officer. The tri-daily indications for the above-named districts and the 11 p. m. indications for Colorado and the vicinity of New York and Philadelphia will be written on Form 109a, all the others on Form 201. The indications for Pennsylvania and Maryland will be sent by messenger to the Baltimore and Potomac depot, and the 7 a. m. indications for New England (special) to W. E. Barrett, 511 Fourteenth street. The other, Form 201, will be filed in the telegraph room. The 11 p. m. and 7 a. m. indications for New England (special) will be for the ensuing twenty-four and forty-eight hours, and those for 11 p. m. will be sent to the observers at Boston, Mass., and New Haven, Conn. The indications for Albany and vicinity will be sent, "charges collect," to James H. Manning, "The Argus," Albany, N. Y. The indications for Ohio, Northern Alabama, and Pennsylvania and Maryland will be sent as railway weather signals, as provided for in paragraphs 152-5. The indications for Omaha and vicinity will be sent to the observer at Omaha. The indications for the vicinity of Baltimore and Washington will be sent, "charges collect," to the Baltimore Sun, and also to the Washington papers. The indications for Southern Virginia will be sent to the Editor, Dispatch, Richmond, Va.

102. Such parts of the synopses, indications, and special bulletin as may be of special interest will be marked in red pencil or other distinguishing color. (Mem. 128, 1884.)

103. The following examples are given as models:

WASHINGTON CITY, *Monday*, ——— ———, 1 a. m.

#### SYNOPSIS FOR THE PAST TWENTY-FOUR HOURS.

The storm which was central yesterday morning in Northern Michigan has moved in a southeasterly direction, and is now central over Lake Erie. The barometer is highest in the South Atlantic States and lowest in the lower lake region. The temperature has risen from 3° to 10° in the lower lake region and New England; it has fallen from 13° to 18° in the Missouri Valley; and is from 20° to 30° above the normal in the Ohio and Upper Mississippi Valleys. Heavy rains have fallen at ——— (stations). Fair weather and southwesterly winds prevail in all districts east of the Mississippi, except in the upper lake region, where the winds are westerly. The winds in the Missouri Valley have shifted to northerly.

The Mississippi has risen 18 inches at Cairo, and the Cumberland 22 inches at Nashville; the Ohio has fallen 19 inches at Cincinnati, the Tennessee 15 inches at Chattanooga, and the Savannah 11 inches at Augusta.

WASHINGTON CITY, *Monday*, ——— ———, 1 a. m.

#### INDICATIONS FOR THE SUCCEEDING TWENTY-FOUR HOURS.

For *New England*: Fair weather, followed by increasing cloudiness and local rains; southerly winds; lower barometer; slight rise in temperature.

For the *Middle Atlantic States*: Fair weather; south to west winds; lower barometer; higher temperature.

For the vicinity of *New York* and *Philadelphia*: Warmer, fair weather.

For the *Gulf States*: Fair weather; southerly winds; lower barometer; stationary temperature.

For the *Ohio Valley* and *Tennessee*: Fair weather; westerly, veering in the northern part to northerly, winds; lower temperature.

For the *Lower Lake Region*: Fair weather, followed by local rains; southwesterly, shifting to northwesterly, winds; falling, followed by rising, barometer; lower temperature.

For the *Upper Lake Region*: Local rains, followed by clearing weather; winds shifting to cooler northerly; higher barometer.

For the *Upper Mississippi and Missouri Valleys*: Fair weather; northerly winds; higher barometer; lower temperature.

For *Colorado*: Colder, fair weather.

**RIVERS.**—The Ohio will fall above Louisville; the Tennessee will rise at Chattanooga; and the Savannah will rise at Augusta.

**SIGNALS.**—Cautionary signals continue at Oswego, Charlotte, Buffalo, Erie, and Cleveland, and are ordered for all stations on the Atlantic coast from Chincoteague, Va., to Eastport, Me. (Ins. 131, 1884.)

**SPECIAL PREDICTIONS FOR TUESDAY.**—Frosts and freezing weather are indicated for the Missouri Valley, and thence southward to Northern Texas. Warmer, fair weather is indicated for the Middle Atlantic States and New England.

#### THE SPECIAL BULLETIN.

104. Immediately after the completion of the synopsis and indications from the a. m. reports, a "special bulletin" will be prepared daily, except Sunday. In the bulletin no reference will be made to barometric conditions, and all technical terms, such as pressure, barometer, &c., will be avoided. It will begin with the most important feature as determined from the reports of the last twenty-four hours; will announce the approach of hot and cold waves; of frosts; the river conditions when dangerous floods exist or are anticipated; the movements of well-defined storms, giving the direction and naming the districts where they will be most severe; the amount of unusual changes in temperature, in general terms, and the current temperature at the several stations where the change has been greatest; the actual rainfall exceeding 1 inch in twenty-four hours for selected stations; the first appearance and movements of locusts; and will contain all data relative to cold-wave signals. Storms and temperature waves will be treated as specifically as possible, and their progress carefully traced from day to day. (Ins. 140, 1884.)

105. The bulletin will close with such indications of weather, storm movements, and river changes as it may be possible to make for the succeeding thirty-six or forty-eight hours. The indications referring to the movements of freshest waves, when practicable, will be given for several days in advance. When frosts which may prove injurious to crops are likely to occur, the bulletin will contain special warnings of their approach, which the officer in charge will telegraph to the observer at stations in the threatened districts with directions to give them the widest distribution.

106. Special temperatures will be given as follows: 7 a. m. temperatures from June 1 to September 30, from Eastport, Montreal, Quebec, Mount Washington, Cleveland, Alpena, Duluth, Saint Paul, Denver, and San Francisco; and from November 1 to April 30, the 3 p. m. temperatures from Washington, Norfolk, Savannah, Atlanta, Jacksonville, Pensacola, New Orleans, Galveston, Los Angeles, and San Diego.

107. The officer in charge will, whenever possible, incorporate in the special bulletin probable changes in the weather in the lake regions and Upper Mississippi and Missouri Valleys, and telegraph the same to the observer at Baltimore, Md., who will furnish a copy to the secretary of the Baltimore Corn and Flour Exchange. (Ins. 28, 1883.)

108. The 10 a. m. special bulletin will be printed in a manner similar to the model bulletin on file in the correspondence and records division, and will be posted in frames at all places where the morning weather chart is displayed. (Ins. 46, 1881; Ins. 80, 1882.)

109. On the first day of each month the officer in charge of the indications division during the preceding month will prepare a special bulletin, in which will be incorporated general remarks on the mean temperature and total precipitation of that month in the several districts, together with brief descriptions of damaging frosts, severe storms, &c., which may have occurred during the same period. The bulletin will close with special directions to those receiving it to give it the widest publication. A copy of the bulletin will be sent direct to the printer before 3 p. m. of the first day of the month, and will be printed in the same manner as the daily special bulletin. The edition will consist of three hundred copies. (Ins. 87 and 108, 1884.)

#### SPECIAL PREDICTIONS.

110. At the close of the indications prepared from the 11 p. m. reports, such indications of weather, storm movements, and river changes will be added as it may be possible to make for the succeeding forty-eight hours.

111. In making special predictions the officer in charge of the indications division will use the names of the districts as shown on the district map. (L. R. 6679, Mis., 1884.)

## STORM WARNINGS.

112. Cautionary signals will be ordered whenever the officer in charge considers it probable that there will occur at the cautionary signal station, or within 100 miles of it on any navigable water, a wind-velocity dangerous to navigation, i. e., reaching a velocity of 25 miles an hour as registered by the anemometer on land. If, at the next regular report following the ordering of signals, it appears that the danger is not so imminent as to justify the display, the signal will be ordered down. (G. O. 28, 1873.)

113. Cautionary off-shore signals will be ordered whenever the officer in charge considers it probable that there will occur at any cautionary signal station on the Atlantic or Gulf coasts dangerous winds blowing in an off-shore direction. The indications officer will assume the undivided responsibility for the display or lowering of all signals. Conditional orders for such display or lowering will not be issued. (L. R. 6679, Mis., 1884.)

114. Signals will be ordered up in the words "Up signals," or "Hoist off-shore signals," and will be ordered down in the words "Signals down." Off-shore signals will be changed to cautionary signals in the words "Change off-shore signals to cautionary." If the off-shore signal is displayed and the wind at the time of the receipt of the order "Signal down" has a velocity of 25 miles or more per hour, the signal will be kept displayed and the velocity of the wind will be ascertained from the self-register at least once in each hour. As soon as the velocity has fallen below 25 miles in any one hour, the signal will be lowered. (L. R. 6679, Mis., 1884.)

115. Whenever cautionary signals are ordered for a storm and the danger from the storm has passed and the signals are continued in anticipation of a second dangerous storm, a special explanatory message will be sent to the stations interested. (Ins. 63, 1880.)

116. The officer in charge will accompany all orders for the display of the several storm-signals with a brief and carefully drawn explanatory message, on Form 206. (Ins. 53, 1882.)

117. When cautionary or other signals are ordered up or down at the stations on the lakes or the Gulf, notification will be sent by telegraph to other stations in the same locality, as directed below. The notification, besides the information that "up," "off-shore," "down signals," &c., are ordered for other stations, will contain the explanatory message embraced in the cautionary order.

118. When signals are ordered up or down at any of the stations on the Gulf coast, viz, Key West, Cedar Keys, Pensacola, Mobile, New Orleans, Port Eads, Galveston, and Indianola, notifications will be sent to all of these stations.

119. When signals are ordered up or down on the lakes notifications will be sent to stations as follows:

Signals ordered on Lake Superior, to stations on Lakes Superior, Huron, and Michigan; signals ordered on Lake Michigan, to stations on Lakes Michigan, Huron, and Erie; signals ordered on Lake Huron, to stations on Lakes Huron, Erie, and Ontario; signals ordered on Lake Erie, to stations on Lakes Erie, Ontario, and Huron, and to Mackinaw City; signals ordered on Lake Ontario, to stations on other lakes. When signals have been ordered displayed at one or more stations on one of the lakes, and due notification has been given, notification of the ordering of additional signals on that lake will not be sent to stations on other lakes. These notifications apply to orders to display, and the orders for lowering signals.

120. The kind of signal shown at Sandy Hook, New Jersey, will be the same as that at New York City. (Ins. 1, 1884.)

121. The officer in charge may give a more extended notification of the ordering of signals when, in his opinion, necessary. (Ins. 91, 1882.)

122. Display boards showing stations where cautionary signals are up, together with the kind of signal, will be kept in the indications division. (L. R. 6679, Mis., 1884.)

123. The officer in charge will verify the orders for display and discontinuance of signals and the record on the display bulletin-board, after which the order will be numbered and entered in the cautionary-signal order book and sent to the telegraph room.

124. At midnight, after completing the press report and special bulletin, and issuing the necessary signal orders, if any, the "good night" message will be prepared, copied in the "signal-order book," verified, and sent to the telegraph room.

125. Whenever a storm is anticipated from Cape May, N. J., to Cape Henry, Va., cautionary signals will be ordered for Baltimore, Md. They will be considered justified whenever the wind at any of the stations from Cape May to Cape Henry, inclusive, reaches a velocity of 25, or more, miles per hour. (Ins. 109, 1883.)

## STORM WARNINGS. (CANADIAN SERIES.)

126. Whenever the conditions indicate dangerous weather in the Dominion of Canada, a message will be transmitted to Professor Carpmæl, Toronto, Canada, on the usual form in cipher. The cipher words for districts are:

Collingwood for Georgian Bay, Saugeen for Lake Huron, Kingston for East Ontario,

Toronto for West Ontario, Stanley for Lake Erie, Montreal, Quebec, Father Point, Gaspe, Bathurst, Shediac for North New Brunswick, Saint John, Pictou for North Nova Scotia, Halifax, Sidney, Yarmouth.

127. The cipher words expressing time and date, published in the cipher book issued from this office, will be used to indicate the time and date when a storm may be expected, thus:

"Storm (or severe storm) Saugeen, Collingwood, Stanley, Cash; Toronto gaul; Kingston neck; Montreal, Quebec, cat;" by which it will be understood that a storm (or severe storm) is expected to reach Saugeen, Collingwood, and Stanley between 7 a. m. and 3 p. m. (75th meridian time), on the 10th; Toronto between 3 p. m. and 11 p. m. on the 10th; Kingston between 11 p. m. on the 10th, and 7 a. m. on the 11th; Montreal and Quebec between 7 a. m. and 3 p. m. on the 11th.

128. When danger is past or no longer threatens any Canadian station that has been warned, a dispatch will be sent to Professor Carpmæl, containing the following words:

(1) Safety; (2) name of station or stations; (3) date and time (cipher word). A "good-night" message will also be sent to Professor Carpmæl at midnight.

129. All messages relating to storm-warnings will be verified in the same manner as original orders and entered in the cautionary-signal order book, but not numbered.

130. A telegram will be sent at or before 9.30 a. m. each Sunday to the director of the Magnetic Observatory at Toronto, Canada, giving the following information:

If there be no definite warnings for Canadian stations based on the current morning reports, and no expectation that there will be any founded on the afternoon reports of the same day, and any warnings sent on the previous day have been acknowledged, the absence of danger will be expressed by the words "nothing coming."

If warnings have been sent, based on Saturday afternoon or night reports, for which acknowledgments have not been received, the fact will be expressed by the words "Saturday afternoon," or "Saturday night," as the case may be, followed by the names of stations for which warnings have been sent.

If the morning reports do not make the immediate issue of warnings necessary, but indicate that there is a fair probability that a warning may be necessary after the receipt of the afternoon reports, this information will be expressed by the words "Sunday evening," with the names of the stations at which the warning will probably be needed.

Warnings based on the current reports will be sent in the usual manner. (Cir. 23, 1874.)

#### FROST.

131. Officers will carefully study the meteorological conditions preceding damaging frosts. Such as threaten any crop or fruit will be announced in indications or by special telegraphic bulletins as early as consistent with reasonable safety, and, if possible, two or three days in advance. These frost warnings will define the regions threatened, state the time, and distinguish between *frosts* and *freezing* weather. The officer in charge will call upon the other members of the indications board for their opinion as to the minimum temperature to be expected and the area threatened. (Ins. 154, 1881; Ins. 155, 1882.)

132. During the period of navigation when freezing temperatures are anticipated in any canal region, special forecasts will be made in the indications and special bulletin.

133. Whenever minimum temperatures of 40° or less are expected frost warnings will be telegraphed to the centers named in the several schedules filed in the indications and telegraph divisions: For the fruit-growing regions, from November 15 to April 15; for the tobacco-growing regions, from September 1 to November 1, or until after killing frosts; for the sugar-growing regions, from October 1 to February 1, or until after killing frosts; for the fruit and vegetable districts about Chattanooga, Tenn., from September 15 to May 1; for districts about Georgetown, S. C., from October 1 to April 1. (Ins. 69, 1879; Ins. 128, 1882; Ins. 6, 21, 24, and 31, 1883.)

134. The frost warnings for the sugar-growing regions of Louisiana will be telegraphed to the Signal Service observer at New Orleans, who will promptly furnish a copy to the secretary of the Louisiana State weather service. The officer in charge of indications will exercise great care in preparing these warnings and make them descriptive of the conditions expected to occur in the northern and southern parts of the State; he will also give the time at which the cold-wave or frost will probably reach the State. Warnings will not be given unless light frosts are expected at least in the northern section of the sugar-growing region; and when the temperature will probably fall below, or to, freezing in any section of the sugar-growing region it will be so stated. (Ins. 123, 1884.)

135. Special frost indications will be prepared for Iowa, Minnesota, Dakota, and other of the extreme Western States, and telegraphed to the Signal Service observer at Pittsburg, Pa. (Ins. 106, 1883.)

136. The following table shows the present arrangement for the distribution of frost warnings, subject to such modifications as may become necessary from time to time:

Center or station.	Address.	Center or station.	Address.
<i>Sugar and fruit-growing interests.</i>		<i>Tobacco-growing interests—Cont'd.</i>	
Charleston, S. C. ....	Observer.	Hartford, Conn. ....	Manager Western Union Telegraph office.
Chattanooga, Tenn. ....	Observer, he to furnish copies to the press and to the Mission Ridge Fruit-Growers Association.	Lancaster, Pa. ....	Do.
Columbia, Tex. ....	J. S. Smith.	Lexington, Ky. ....	Do.
Galveston, Tex. ....	Observer.	Louisville, Ky. ....	Observer.
Georgetown, S. C. ....	David Kelsey.	Lynchburg, Va. ....	Do.
Jacksonville, Fla. ....	Observer.	Madison, Wis. ....	Manager Western Union Telegraph office.
New Orleans, La. ....	Do.	Memphis, Tenn. ....	Observer.
<i>Cranberry-growing interests.</i>		Nashville, Tenn. ....	Do.
Boston, Mass. ....	Do.	New Haven, Conn. ....	Do.
Philadelphia, Pa. ....	Do.	New York City. ....	Do.
<i>Tobacco-growing interests.</i>		Palmer, Mass. ....	Manager Western Union Telegraph office.
Ashville, N. C. ....	Panniman & Co.	Philadelphia, Pa. ....	Observer.
Cincinnati, Ohio. ....	Observer.	Raleigh, N. C. ....	Manager Western Union Telegraph office.
Elmira, N. Y. ....	Manager Western Union Telegraph office.	Richmond, Va. ....	Do.
Hannibal, Mo. ....	Do.	Do. ....	W. H. Greene, superintendent Richmond and Danville Railroad.
Harrisburg, Pa. ....	Do.	Saint Louis, Mo. ....	Observer.
Do. ....	Superintendent of telegraph, Reading Railroad Company.	Springfield, Mass. ....	Manager Western Union Telegraph office.
		Washington City. ....	Observer.
		Wilmington, Del. ....	Manager Western Union Telegraph office.
		York, Pa. ....	Do.

## COLD WAVES.

137. A square white flag, with black square in center, will be displayed at stations upon receipt of telegraphic orders from this office, to indicate that a "cold wave" is approaching, and will be designated the "cold-wave signal."

Whenever a decided fall in temperature is expected to occur at any of the stations named in paragraph 136, the officer in charge of the indications division will telegraph the observer in the following form: "Hoist cold-wave signal; temperature will probably fall — degrees during next — hours."

Great care must be exercised in ordering cold-wave signals, and, if possible, they will be ordered in season for the observers at printing stations to give notice in the Farmers' Bulletin of the coming cold wave.

When the temperature has reached the minimum, the cold-wave signal will be ordered down by telegraph, thus: "Cold-wave signal down." (Ins. 105, 1884.)

138. The following is a list of stations at which cold-wave signals will be displayed:

Albany, N. Y.; Atlanta, Ga.; Auburn, Ala.; Augusta, Ga.; Baltimore, Md.; Bangor, Me.; Boston, Mass.; Buffalo, N. Y.; Burlington, Iowa; Cairo, Ill.; Charleston, S. C.; Charlotte, N. C.; Chattanooga, Tenn.; Chicago, Ill.; Cincinnati, Ohio; Cleveland, Ohio; Columbus, Ohio; Concordia, Kans.; Davenport, Iowa; Denver, Colo.; Des Moines, Iowa; Detroit, Mich.; Dodge City, Kans.; Dubuque, Iowa; Galveston, Tex.; Grand Haven, Mich.; Greencastle, Ind.; Indianapolis, Ind.; Jacksonville, Fla.; Kansas City, Mo.; Keokuk, Iowa; Knoxville, Tenn.; Leavenworth, Kans.; Little Rock, Ark.; Logansport, Ind.; Louisville, Ky.; Lynchburg, Va.; Madison, Wis.; Memphis, Tenn.; Milwaukee, Wis.; Montgomery, Ala.; Nashville, Tenn.; New Haven, Conn.; New London, Conn.; New Orleans, La.; New York City; Norfolk, Va.; Omaha, Nebr.; Philadelphia, Pa.; Pittsburg, Pa.; Portland, Me.; Rochester, N. Y.; Saint Louis, Mo.; Saint Paul, Minn.; Sandusky, Ohio; Savannah, Ga.; Shreveport, La.; Springfield, Ill.; Toledo, Ohio; Vicksburg, Miss.; Washington City; Wilmington, N. C.

139. Orders relating to cold-wave signals for Kansas City will be addressed to T. S. Case, postmaster, and dispatcher's office, Fort Scott and Gulf Railroad. Orders for Auburn, Ala., will be addressed to P. H. Mell, jr. (L. R. 6679, Mis., 1884.)

140. Whenever cold-wave signals are ordered for Columbus, Ohio, similar warnings will be telegraphed to the director, Ohio meteorological bureau, Columbus, Ohio. (Ins. 2, 1885.)

141. Whenever cold waves are expected to occur in the vicinity of the Baltimore and Ohio Railroad, the officer in charge of the indications division will telegraph

warnings of their approach to Superintendent Seldon, Baltimore; General Superintendent Zeublin, Chicago, and Superintendent Leslie, New York City. The warnings will contain the names of the States in which the cold waves are expected. The following list comprises the States over which the Baltimore and Ohio system chiefly operates: New York, New Jersey, Pennsylvania, Maryland, Virginia, West Virginia, Ohio, Indiana, Illinois, and Kentucky. (Mem. 127, 1884.)

142. A display board showing where cold-wave signals are up will be kept in the indications division. (L. R. 6679, Mis., 1884.)

143. Cold-wave signal orders will be verified by the officer in charge, entered in the cold-wave signal order-book, and checked with the display board, after which they will be sent to the telegraph room. (L. R. 6679, Mis., 1884.)

144. During his tour of duty the officer in charge of the indications division will make a study of approaching changes of temperature as indicated in the Northwest, Montana, Manitoba, and Dakota, and adjacent sections, with a view of determining rules of value in predicting cold and warm waves. A careful study of the charts on file for past years will probably indicate practical rules of great value. In connection with the foregoing he will include a special study of atmospheric changes which precede frosts. (Ins. 100, 1884; Mem. 78, 1884.)

#### FLOODS.

145. The river reports will be entered on a special form and the changes briefly noted in the synopsis. Whenever greater than 12 inches they will be stated thus: "The rivers have risen (or fallen) at" [here give the names of stations and amount of change]; or "decidedly risen (or fallen) at ———"; or give the number of feet, where the change is remarkable. When the river is near or above the danger-line at any place all changes will be noted. When the probable changes may be of great importance they will also be mentioned in the special bulletin. (G. O. 23, 1873.)

146. Telegraphic warnings may be sent at the discretion of the officer in charge to all districts menaced by dangerous floods.

147. Whenever danger from floods in the Potomac River is anticipated, and word is sent to the merchants of Georgetown and to the press at Washington, &c., of such impending floods, a duplicate message will be sent by the officer in charge of indications to the superintendent of the United States carp ponds, through the Telephone Exchange and National Museum. (Ins. 17, 1884.)

#### NORTHERS.

148. When "northers" are anticipated telegraphic warnings will be sent to the regions menaced according to the schedule in the indications division, subject to modification from time to time.

Co-operating railroad.	Central distributing station.	Persons addressed.
Burlington and Missouri River Railroad, Nebraska.	Omaha, Nebr. ....	General manager.
Atchison, Topeka and Santa Fé Railroad.	Topeka, Kans. ....	Superintendent of telegraph.
Missouri Pacific Railway .....	Saint Louis, Mo. ....	Superintendent of transportation.
Saint Louis and San Francisco Railway .....	Springfield, Mo. ....	Superintendent of telegraph.
International and Great Northern Railroad .....	Palestine, Tex. ....	Assistant superintendent of telegraph.
Dallas and Wichita Railroad .....	Dallas, Tex. ....	General manager.
Texas and Saint Louis Railway .....	Pine Bluff, Ark. ....	General superintendent.
Texas and Pacific Railway .....	Marshall, Tex. ....	Superintendent of telegraph.
Houston and Texas Central Railway .....	Houston, Tex. ....	General superintendent.
Galveston, Harrisburg and San Antonio Railway.	do .....	Do.
Mexican National Railway .....	Corpus Christi, Tex. ..	Do.

#### TORNADOES.

149. The officer in charge of indications will carefully study the tri-daily weather charts of previous years, with a view of becoming familiar with the atmospheric conditions which are likely to exist during the occurrence of tornadoes in the various sections of the country.

150. When the current weather report is such as to indicate the probable occurrence of tornadoes, the indications prepared from such report will contain special warning, in the following form:

"Dangerous local storms, or violent local storms are indicated for ———" (naming districts or States).

These warnings will be telegraphed to the Signal Service stations in the threatened districts. The word "tornadoes" will not be used in making these forecasts. (Ins. 60, 1883.)



## LOCUSTS.

151. The first appearance and subsequent movement of locusts when reported to this office will be mentioned in the special bulletin and synopsis.

## RAILWAY WEATHER SIGNALS.

152. The officer in charge of the indications division will telegraph to Prof. P. H. Mell, jr., director Alabama State weather service, Auburn, Ala., at 1 a. m., daily, special weather forecasts for the ensuing day for the State of Alabama.

The forecasts will contain predictions of temperature, whether higher, lower, or stationary; general rain, local rain, or fair weather; and will be telegraphed in conformity with the following system of flag signals:

White.	Fair weather.	White.	Fair weather.
Yellow.	Higher temperature.	Blue.	Stationary temperature.
Yellow.	Local rains.	Yellow.	Local rains.
Blue.	Stationary temperature.	White.	Lower temperature.
Blue.	General rains.	Blue.	General rains.
White.	Lower temperature.	Yellow.	Higher temperature.
Yellow.	Local rains and higher temperature.	Blue.	General rains and stationary temperature.

The forecasts will be telegraphed in the exact words printed opposite the signals, as shown herein. (Ins. 107, 1884.)

152a. Since the adoption of the above signals by the Alabama weather service, the system has been superseded by the following :

### EXPLANATION OF SIGNALS.

#### PREPARATION OF INDICATIONS.

The weather indications furnished to the State by the Chief Signal Officer are based on observations taken in all parts of the country three times a day. The morning indications are prepared at 11 p. m. (eastern standard time) of the preceding night, and hold good till the following morning.

#### DISPLAY OF FLAGS.

In accordance with these indications the proper official flags should be selected and promptly displayed. If elevated on a pole, they should be so arranged as to read downward. If the indications read \_\_\_\_\_ followed by \_\_\_\_\_, then a space, the width of a flag, should be left vacant on the pole to indicate "followed by." The signals should be withdrawn at 3 p. m.

#### MEANING OF FLAGS.

No. 1 [white flag] refers always to fair or clear weather.

No. 2 [orange flag] refers always to local rains.

No. 3 [blue flag] refers always to general rains.

No. 4 [black triangle flag] refers always to temperature. When placed above either Nos. 1, 2, or 3 indicates rising temperature; when placed below these numbers (1, 2, or 3) indicates falling temperature, when absent from the pole stationary temperature is indicated.

No. 5 [white flag with black square] refers always to decidedly colder weather, and is generally issued twenty-four hours in advance of the expected fall of temperature. This signal is not ordered unless it is expected that the temperature will fall to 45 degrees Fahrenheit, or below, within the time stated in the order.

No. 6 [orange flag with black square] indicates the approach of a cyclonic wave.

#### EXAMPLES.

"Cooler, fair weather," display flag No. 1 with No. 4 below it.

"General rains, higher temperature," display No. 3 with No. 4 above it.

"Stationary temperature and local rains," display No. 2 only.

"Stationary temperature and general rains, followed by cooler clear weather," display No. 3 (space) and No. 1 with No. 4 below it.

Public notice of these explanations should be secured in local newspapers as generally as possible, and by posting this card near the point of display where it can be examined by the public.

153. The officer in charge of the indications division will telegraph to the director, Ohio meteorological bureau, Columbus, Ohio, at 1 a. m., daily, special weather forecasts for the ensuing day for Ohio. An additional telegram will be forwarded at 10 a. m., whenever sudden changes render it necessary.

154. The forecasts will contain predictions of temperature, whether higher, lower, or stationary; general rain or snow, local rain or snow, or fair weather; and will be forwarded in conformity with the adopted system of signals.

155. The signal will consist of two figures which differ in color, being red or blue, and in form being shaped like the sun, a crescent, or a star. The red color refers to the temperature, and the blue color to the state of the weather, as rainfall or snow; they are used as below :

*Railway weather signals.*

Sun.

Crescent.

Star.



*Red.*—Sun, higher temperature ; crescent, lower ; star, stationary.

*Blue.*—Sun, general rain or snow ; crescent, clear or fair weather ; star, local rain or snow.

Similar forecasts will be prepared for the region of the following-named railroads and telegraphed at 1 a. m., daily :

Cumberland Valley Railroad, General J. F. Boyd, superintendent, Chambersburg, Pa.

Frederick division, Pennsylvania Railroad, J. B. Hutchinson, superintendent, York, Pa.

The officer in charge of the indications division will send or designate the symbols to be used, and will not telegraph the written indications. (Ins. 31, 1884.)

The 11 p. m. indications for New England will also be sent by this code, except that the flag will be designated by numbers instead of by symbols, as follows: Red sun, flag No. 1 ; red crescent, flag No. 2 ; red star, flag No. 3 ; blue sun, flag No. 4 ; blue crescent, flag No. 5 ; blue star, flag No. 6.

## INDICATIONS BOARD.

156. The "indications board" will be permanently organized, the personnel of which will be announced from time to time.

157. The members of the board will successively perform, for one month each, the following duties :

(a) Indications.

(b) Inspection of stations.

(c) Fact and international bulletin division.

(d) Charge of instruction and personal study.

158. The members present will assemble at 10 o'clock a. m., daily, in the indications room, to study and discuss all meteorological conditions, but the indications officer will prepare his indications and bulletin independently, and will be responsible for them.

159. When the seasons arrive at which frosts, floods, northers, or the flights of locusts may be expected, each member of the board present will inspect daily the meteorological conditions of the country to discover any danger from those causes, and will on occasion notify the senior officer present, who will at once call the full board together for further study and consultation upon the subject.

160. The senior officer of the board present will have general charge during sessions of the board, and will be responsible for the proper performance of its work, in accordance with the published regulations. The officer specially detailed on indications for the current month will be responsible for all indications, signal orders, and special bulletins during his tour, availing himself of the advice of the board when he so desires.

161. It is the duty of any member of the board to notify the officer in charge of the indications division of any weather indications which he thinks may have escaped attention.

162. All communications affecting the work or duties of the board will be transmitted through the senior officer to the Chief Signal Officer.

163. The board will report daily, in writing, to the Chief Signal Officer the result of the previous day's work, embracing in the report of the board all omissions or other matters seeming to require attention, including those, if any, of the indications officer.

164. Verifications of predictions will be made by the board. (Ins. 89, 1883.)

## VERIFICATIONS OF INDICATIONS.

165. The indications board will determine the percentage of verification of the current indications in accordance with the following instructions :

(a) The percentage of verifications of wind predictions will be determined by considering only the direction.

(b) The indications made up from each report will be compared with the facts shown by the three succeeding tri-daily reports.

(c) In estimating the percentages, ascertain whether the conditions predicted for each district have prevailed in it to the amount of one-fourth, one-half, three-fourths, or the whole of the area of the district.

(d) Predictions which are found to be more than three-fourths verified will be considered completely verified, and represented by 100 or 100 per cent. in that column of the blank to which the prediction refers. Predictions which are not wholly verified will be represented in the proper column of the blank by 75 per cent., 50 per cent., or 25 per cent., as the facts may warrant. Predictions which have fallen below 25 per cent. in verification will be rated as not verified and represented by 0 in the proper column.

(e) If, in the indications for any particular district, any class of predictions is not referred to, such omissions will be represented by a dash (—).

(f) To determine the percentage of verification, divide the sum of the percentages of a single class for the month by the number of predictions made of that class. To determine the percentage of verifications for any district, divide the sum of the percentages of the several classes of predictions by the number of classes. To determine the percentage of verification for the United States, divide the sum of percentages of verifications by the number of districts.

(g) A maximum percentage of verification can be got only when the four elements under each district are named in the indications of the entire month.

(h) To determine the percentages of failures to predict for any element, divide the number of failures to predict for that element by the entire number of tri-daily reports during the month. (G. O. 28, 1873; Cir. 7, 1874.)

(i) The indications for the three districts on the Pacific coast will be verified as to weather according to the usual rule, and will be published in the general percentages of verifications. (Ins. 17, 1879.)

(j) The indications will be verified from a printed copy first corrected by the assistant in charge of the indications division. (Ins. 9, 1881.)

(k) the statement of percentage of signals justified, &c., will show the number of storms reported with wind velocity of 25 miles or over per hour for which cautionary signals have not been ordered. (Ins. 24, 1880.)

(l) Indications of barometer changes will be verified and counted in making up the monthly average of verifications. (Ins. 69, 1884.)

(m) In verifying temperature in special predictions, the three charts of the day for which the prediction is made will be compared with the three corresponding charts of the preceding day.

(n) If at the time the prediction is made, precipitation is actually taking place, and precipitation is predicted, the prediction will not be considered fully verified unless precipitation is recorded on the second chart.

(o) The expression "continued cold" or "continued warm" weather, when used, will be understood to mean that the temperature will remain stationary.

(p) When light variable winds are predicted, any "calms" reported will be considered in verifying as "variable."

(q) The expression "partly cloudy" will be understood to mean totally cloudy at a portion of the stations.

(r) When fair weather is predicted and rain occurs within twenty-four hours the prediction will be verified on the basis of the area of rainfall in the district, giving zero for rain occurring over the entire district.

(s) In order to fully verify the prediction, "local rains followed by fair weather," precipitation must occur on the first or second charts, and no precipitation be reported in three-fourths of the district on the last chart.

(t) When "colder" or "warmer" weather, preceded by a "rise" or "fall" in temperature is predicted, the prediction for "colder" or "warmer" will be considered as applying to the twenty-four hour prediction.

## REPORTS.

166. A tri-daily report of the time of completion and delivery of the daily publications of the indications division will be made in the form given below. The indications officer will lay these three reports on the Chief Signal Officer's table not later than 12 noon daily.

[Form No. 425 g—1885.]

*Indications officer's tri-daily report.*

Date, \_\_\_\_\_ Hour, \_\_\_\_\_ Messenger's name, \_\_\_\_\_

Time delivered.	Special bulletin.	Farmers' bulletin.	Time delivered to messenger.	To whom delivered.	Time of delivery to be entered by receiver.	Signature of receiver.
.....	.....	.....	.....	N. Y. Associated Press.....	Tri-daily list—always first.	.....
.....	.....	.....	.....	U. S. Associated Press.....		.....
.....	.....	.....	.....	W. U. Tel. Co.....		.....
.....	.....	.....	.....	B. & M. Tel. Co.....		.....
.....	.....	.....	.....	W. E. B., 511 14th St.....		.....
.....	.....	.....	.....	B. & P. Depot.....	Daily list.	.....
.....	.....	.....	.....	Secretary of War.....		.....
.....	.....	.....	.....	Critic.....		.....
.....	.....	.....	.....	Star.....		.....
.....	.....	.....	.....	Post.....		.....
.....	.....	.....	.....	Republican.....	Weekly list, for Sunday.	.....
.....	.....	.....	.....	Post Office.....		.....
.....	.....	.....	.....	Journal.....		.....
.....	.....	.....	.....	Herald.....		.....
.....	.....	.....	.....	Capital.....		.....
.....	.....	.....	.....	Chronicle.....		.....

Material for morning map delivered to printer, at \_\_\_\_\_ a. m.

Map completed and in hands of messenger at \_\_\_\_\_ a. m.

I certify that the foregoing is a true return for the report and date named: \_\_\_\_\_

\_\_\_\_\_, *Indications Officer.*

NOTE.—The midnight indications will be prepared and delivered to the Associated Press companies not later than 1 a. m. The indications officer will lay these reports on the table of the Chief Signal Officer not later than 12 m.

W. B. HAZEN,

*Brigadier and Brevet Major-General, Chief Signal Officer, U. S. Army.*

## APPENDIX 3.

## REPORT OF OFFICER IN CHARGE OF THE DIVISION OF THE PACIFIC.

SIGNAL OFFICE, WAR DEPARTMENT,  
San Francisco, Cal., July 27, 1885.

SIR: I have the honor to make the following report of the operations of this division for the year ending June 30, 1885:

Having been informed that I would be ordered to take station at San Francisco, with a view to giving the people of the Pacific coast the full benefit to be derived from the Signal Service, and directed to make the necessary preparations, my time was occupied during December, 1884, and January, 1885, in extracting data from the Signal Service records in the office of the Chief Signal Officer.

In obedience to paragraph 5, Special Order No. 1, Headquarters of the Army, Adjutant-General's Office, Washington, January 2, 1885 (copy herewith marked A), and your letter of instructions of January 6, 1885 (marked B), I left Washington February 2, and reached San Francisco February 11.

In accordance with letter of instructions, War Department, Adjutant-General's Office, Washington, January 2, 1885 (marked C), on February 12, I left San Francisco for San Luis Obispo, Cal. After an examination of that section, including telegraph facilities, &c., I decided upon San Luis Obispo as the best location for a Signal Service station. February 16 I returned to San Francisco. Private George A. Rivière, Signal Corps, U. S. Army, reported to me for duty, having arrived February 15. I proceeded to Red Bluff, Cal., the 17th, and returned to San Francisco the 18th. Private B. S. Pague, Signal Corps, U. S. Army, arrived February 22.

Pursuant to your letter of instructions, Signal Office, War Department, Washington City, January 10, 1885 (marked D), I made an effort, February 25, to underrun the submarine cable between "The Presidio" and Alcatraz Island. With the facilities available it was found impossible to raise the cable; therefore the repair of the same was postponed until sufficient money should be at my disposal to enable me to hire the necessary apparatus for recovering the cable.

I was extremely fortunate in securing from March 1, 1885, rooms Nos. 45 and 46, fourth floor (across the hall from the operating rooms of the Western Union Telegraph Company), No. 302 Montgomery street, for use as an office. On March 21 I left for Monterey and Santa Cruz, Cal., and returned to San Francisco March 23.

The office supplies arrived from Washington March 26. On March 28 the preparation of tri-daily charts from the telegraphic reports began. Privates Pague and Rivière had become sufficiently expert in the preparation of the charts to begin the issue of the synopses and indications for the Pacific districts to the public through the San Francisco daily papers, the Associated Press, and the Farmers' Bulletin, twice daily; at 1 p. m., Pacific time, for the afternoon papers, and 9 p. m., Pacific time, for the morning papers and Farmers' Bulletin, excepting on Sundays at 9 p. m. only. I inclose a sample copy of the charts prepared (marked E), a copy of the synopses and indications (marked F), a copy of the Farmers' Bulletin (marked G), and a list showing the distribution of the synopses and indications (marked H). The percentages of verifications of the indications, made by myself, are:

	Per- cent- age.	Aver- age for district.	Month- ly aver- age.	
APRIL, 1885.				
North Pacific:				
Weather.....	88.5	} 84.4	} 83.62	
Wind direction.....	91.7			
Temperature.....	73.1			
Middle Pacific:				
Weather.....	89.1	} 79.7		
Wind direction.....	78.8			
Temperature.....	71.2			
South Pacific:				
Weather.....	94.9	} 86.8		
Wind direction.....	89.1			
Temperature.....	76.3			

	Per cent- age.	Aver- age for district.	Month- ly aver- age.		
MAY, 1885.					
North Pacific:					
Weather.....	83.8	82.0	87.57		
Wind direction.....	87.7				
Temperature.....	74.6				
Middle Pacific:					
Weather.....	96.1	85.7		87.57	
Wind direction.....	88.1				
Temperature.....	72.8				
South Pacific:					
Weather.....	93.4	95.0			87.57
Wind direction.....	98.7				
Temperature.....	93.0				
JUNE, 1885.					
North Pacific:					
Weather.....	85.3	85.27	89.63		
Wind direction.....	92.0				
Temperature.....	78.6				
Middle Pacific:					
Weather.....	96.4	89.29		89.63	
Wind direction.....	91.1				
Temperature.....	80.4				
South Pacific:					
Weather.....	98.2	94.34			89.63
Wind direction.....	95.4				
Temperature.....	88.4				
General average.....					

Since the opening of this office no cautionary signals have been ordered to be displayed at any of the signal stations along the coast; in fact no dangerous storms have passed over any portion of the coast of the Pacific districts.

At San Diego, Cal., on April 20, the wind reached a velocity of 25 miles per hour, from the west, during clear weather. The observer reports "Storm not considered dangerous to shipping or other interests."

Hourly wind velocities of over 24 miles per hour from a westerly direction have been of frequent occurrence at San Francisco, while clear or partly cloudy weather prevailed. The maximum velocity of 36 miles per hour from the west was recorded June 21. On April 16 four schooners, which had sailed the 15th, returned to port, not having been able to withstand the strong northwest wind and heavy sea. April 26 two schooners returned to port, having had their fore-mast heads carried away by strong northwest winds encountered about 40 miles off Point Tomales, California. The observer reports "These velocities are not considered dangerous to shipping."

At Fort Canby, Wash., a velocity of 25 miles per hour from the south, while light rain was falling, was recorded May 13; 32 miles from the south, with light rain, May 18. The observer reported that "Southerly gales are not considered dangerous on Columbia bar. The display of cautionary signals would have been of no benefit to shipping."

At Port Angeles, on April 14, a velocity of 30 miles per hour from the west, during clear weather, and on June 5, 23 miles from the northwest during clear weather, were recorded. The observer reports "No casualties reported," and his report of February 3, 1885, "In a great measure I do not think there have been any high winds here that could be considered dangerous to the shipping interests by what I have seen and learned from sea-faring men." In all of these cases, if signals had been displayed, they would have been of no value and would have unnecessarily delayed vessels, excepting some small coasting schooners.

I have not as yet been able to determine the danger velocities of winds for the several directions under different conditions of the weather at the various stations, but hope to do so before the stormy season commences.

Through the press, those having special interests to be protected from frost, rain, floods, &c., have been requested to inform me of the same, with the probable dates between which they desired warning, but I have not received any communications upon the subject. In the same manner I have requested those having records of observations of the temperature, direction and force of the wind, rainfall, snowfall, thunder storms, "northers," and destructive frosts, storms, and floods, to send me copies of the same, by months, for past years, and at the close of each month in future. I have to acknowledge the receipt of meteorological records from Mr. Charles W. Friend, Carson City, Nev.; Mr. Robert Hall, Sonoma, Cal.; Mr. H. C. Tower, Santa Monica, Cal.; Mr. George A. Raymond, San Rafael, Cal.; Dr. W. W. Hayes and Sinsheimer

Bros., San Luis Obispo, Cal., through Corporal Thomas Gibson, Signal Corps, U. S. Army; Mr. Albert Dibblee, Fern Hill, near San Rafael, Cal.

Pursuant to instructions contained in your communication of March 19, 1885 (marked I), the Rev. W. H. Weinland was instructed in the duties of an observer. He sailed on May 19, 1885, on the schooner "Lizzie Merrill" for his station Mumtrekhlaga-mut, Alaska.

As per instructions contained in your communication of May 18, 1885 (marked K), Sergeant Nelson Gorom, Signal Corps, U. S. Army, is being instructed in the "indications" work of this office.

In this section the people are especially interested in the rainfall, on account of the effect of the same upon the growing crops. It is believed there are special interests that can be beneficially served.

All my spare time has been devoted to the following: Drawing isobars upon the charts for past years prepared at the office of the Chief Signal Officer for this office; copying data which I extracted from the records of the office of the Chief Signal Officer; making extracts from the Central Pacific Railroad Company's records, newspapers, vessel reports, and records of private individuals; placing available data into suitable shape for quick reference.

Letters received during the year.....	511
Letters written during the year.....	788
Monthly reports received from voluntary observers.....	41

I am, sir, very respectfully, your obedient servant,

ROBT. CRAIG,  
*First Lieutenant Fourth United States Artillery,  
A. S. O. and Assistant In Charge.*

The CHIEF SIGNAL OFFICER U. S. ARMY,  
*Washington, D. C.*

#### A.

SPECIAL ORDERS, }  
No. 1. }

HEADQUARTERS OF THE ARMY,  
ADJUTANT-GENERAL'S OFFICE,  
*Washington, January 2, 1885.*

[Extract.]

5. By direction of the Secretary of War, First Lieutenant Robert Craig, Fourth Artillery, acting signal officer, is relieved from duty in this city, and will proceed via Yuma, Ariz., and Los Angeles, Cal., to San Francisco, Cal., and take station at that point, carrying out such instructions as he may receive from the Chief Signal Officer of the Army. The travel herein directed is necessary for the public service.

By command of Lieutenant-General Sheridan.

R. C. DRUM,  
*Adjutant-General.*

#### B.

SIGNAL OFFICE, WAR DEPARTMENT,  
*Washington City, January 6, 1885.*

SIR: In carrying out the provisions of paragraph 5, Special Orders No. 1, Adjutant-General's Office, January 2, 1885, the Chief Signal Officer directs, that upon arrival at San Francisco, Cal., you will open a branch signal office for the service of the Pacific coast, and carefully study the whole field, making your office fully acquainted with the entire subject. You will determine what can be done to make the service most useful to the people of the Pacific coast, and render such service, in the way of indications, special predictions, signals, and otherwise as your facilities and means will permit; you will make monthly report to this office, showing, in general and detail, all that you may accomplish.

Very respectfully, yours,

B. M. PURSELL,  
*Second Lieutenant, Signal Corps, U. S. Army.*

First Lieut. ROBERT CRAIG,  
*Fourth Artillery, Acting Signal Officer and Assistant, Washington, D. C.*

A true copy.

B. M. PURSELL,  
*Second Lieutenant, Signal Corps, U. S. Army.*



C.

WAR DEPARTMENT, ADJUTANT-GENERAL'S OFFICE,  
Washington, January 2, 1885.

(Through the office of the Chief Signal Officer, U. S. A.)

SIR: The Secretary of War directs, as necessary to the interests of the service, that you proceed from San Francisco to Red Bluff, Cal., and return; from San Francisco to Monterey and Santa Cruz, Cal., and return, and from San Francisco to San Luis Obispo and Los Alamos, Cal., and return to San Francisco, carrying out such special instructions as you may receive from the Chief Signal Officer of the Army.

Very respectfully, your obedient servant,

R. C. DRUM,  
Adjutant-General.

First Lieut. ROBERT CRAIG,  
Fourth Artillery, Acting Signal Officer.

[1st indorsement.]

SIGNAL OFFICE, Washington City, January 6, 1885.

Respectfully transmitted to First Lieut. Robert Craig, Fourth Artillery, acting signal officer and assistant, Washington, D. C., who will carry out as per verbal instructions received by him from the Chief Signal Officer.

By order of the Chief Signal Officer:

B. M. PURSELL,  
Second Lieutenant, Signal Corps, U. S. Army.

A true copy.

B. M. PURSELL,  
Second Lieutenant, Signal Corps, U. S. Army.

D.

WAR DEPARTMENT,  
OFFICE OF THE CHIEF SIGNAL OFFICER,  
Washington, D. C., January 10, 1885.

SIR: The Chief Signal Officer directs that upon your arrival at San Francisco you will at once take steps to recover and repair the sub-marine telegraph cable between the Presidio wharf and Alcatraz Island, recently reported broken by a ship's anchor.

In view of the small amount of money available for this work, you will request the division commander to furnish such assistance by the use of the quartermaster steamer and the labor of troops or prisoners as will reduce expenses to the lowest possible figure.

Such telegraph tools as are not on hand may be borrowed from the Western Union Telegraph Company at San Francisco, as was done on a similar occasion a year ago.

The services of one or more experts may be employed to superintend the recovery of the broken end of the cable and to make the splice; also such other necessary assistance and material as cannot be supplied by the military authorities; but before incurring any expenses you will obtain careful estimates of the probable cost of the entire work and telegraph them to this office for approval.

A sufficient quantity of spare cable is on the spot should it be found necessary to cut out and replace any weak or defective parts near the end of the cable.

The cable was originally laid from Fort Mason to Alcatraz Island, but, being broken by an anchor shortly afterward, was taken up and relaid from the Presidio wharf to the island. This was done by order of the division commander, and because it was thought that injury to the cable would thereafter be of rare occurrence, as vessels seldom anchor near that route.

No change in the present route will be made by you unless you are fully convinced from personal examination and careful inquiries of persons familiar with the locality that it will lessen the danger of injury to the cable; and not then until such change has been approved by the Chief Signal Officer.

A copy of a map showing the location of the cable and connections is inclosed for your information; also copies of telegrams referring to broken cable.

By order of the Chief Signal Officer.

Very respectfully,

F. M. M. BEALL,  
Second Lieutenant, Signal Corps.

First Lieut. ROBERT CRAIG,  
Fourth Artillery, A. S. O. and Assistant, Washington, D. C.

## F.

SIGNAL SERVICE U. S. ARMY,  
DIVISION OF THE PACIFIC,  
San Francisco, Cal., Tuesday, June 30, 1885—9 p. m.\*

*Synopsis for the past 24 hours.*

The barometer is about normal in the South Pacific, and slightly below in the Middle and North Pacific.

The temperature is about normal in all the districts.

The winds have been generally light to fresh and southerly in the South Pacific; light and variable in the North Pacific; variable in the Middle Pacific, with high northerly winds at Cape Mendocino.

Light local rains have fallen in the North Pacific; fair weather has continued in the Middle and South Pacific.

*Indications for the succeeding 24 hours.*

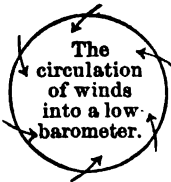
For the North Pacific, cloudy weather, local rains, light variable winds, generally northwesterly, stationary temperature along the coast and cooler over the interior.

For the Middle Pacific, fair weather, followed in northern part by local thunder storm, variable winds, generally southwesterly in southern part, nearly stationary temperature.

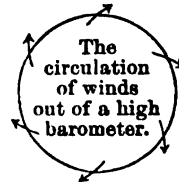
For the South Pacific, fair weather, variable winds, generally southwesterly, stationary temperature.

CRAIG.

## G.



[Farmers' Bulletin. War Department, Office of the Chief Signal Officer, Division of Telegrams and Reports for the Benefit of Commerce and Agriculture.]



SAN FRANCISCO, CAL., Thursday, May 28, 1885—9 p. m.

*Synopsis for the past 24 hours.*

The barometer is slightly above the normal in Washington Territory, and slightly below in Oregon and California, being lowest over Northern California. The temperature is slightly above the normal in the South Pacific, from four to twenty degrees above in the Middle Pacific, and three to fifteen degrees above in the North Pacific. The winds have been variable; generally westerly in the South Pacific and southern part of the Middle Pacific, and northerly in the northern part of the Middle Pacific and southern part of the North Pacific. Fair weather has continued in all the Pacific districts, excepting light rain in the northwestern corner of Washington Territory.

*Indications.*

For the North Pacific, slightly warmer, generally fair weather, variable winds, generally northwesterly.

\* Pacific time.

For the Middle Pacific, fair weather; variable winds, generally southwesterly over the southern part, nearly stationary temperature.

For the South Pacific, fair weather, variable, followed by westerly winds, nearly stationary temperature.

For the Middle Pacific coast region, during the month of May, winds blowing from the southeast to southwest are found to be the winds most likely to be followed by rain. Winds blowing from the north to east are found to be the winds least likely to be followed by rain.

*General laws accompanying weather changes in the United States.*—Weather changes affecting the locality in which this bulletin is posted generally appear first to the westward. An area of low barometer (storm-center) generally moves slightly to the north of east; an area of high barometer generally moves slightly to the south of east. In advance of the low barometer are generally found rain-winds and increasing cloudiness, with rain or snow; in rear of a low barometer are generally found colder, dry winds and clearing weather.

*Meteorological summary for the month of May.*

Mean barometer, corrected for temperature and instrumental error, only....	29.944
Mean barometer, reduced to sea-level .....	30.014
Mean monthly range of barometer.....	0.380
Mean temperature.....	56° 2
Highest temperature (in 1883) .....	86° 0
Lowest temperature (in 1876, '79, '80, and '82).....	45° 0
Mean monthly range of temperature .....	30° 8
Average precipitation .....	inch. 0.68
Prevailing wind.....	West.

Published by co-operation of the War and Post-Office Departments.

W. B. HAZEN,  
Chief Signal Officer.

## H.

LIST OF PAPERS, ETC., RECEIVING THE SYNOPSES AND INDICATIONS.

1 p. m.—1 for file; 1 for office Chief Signal Officer; 1 for Associated Press (Pacific Coast, M. A. Richardson, agent); 1 for The Evening Bulletin; 1 for The Evening Post; 1 for The Daily Report; 1 for Die Abend Post; 1 for Western Union Telegraph Office (posted in office).

9 p. m.—1 for file; 1 for office Chief Signal Officer; 1 for Associated Press; 1 for The Chronicle; 1 for The Call; 1 for The Alta; 1 for The Examiner; 1 for Le Courrier de San Francisco; 1 for Der Demokrat; 1 for Western Union Telegraph Office (posted in office); 1 for The Commercial News; 1 for the Observer Signal Corps, San Francisco.

## J.

SIGNAL OFFICE, WAR DEPARTMENT,  
Washington City, March 19, 1885.

SIR: I am directed by the Acting Chief Signal Officer to inform you that a station of the second order has been ordered established at Muntrekhlagamut, Alaska, of which Rev. William H. Weinland will have charge.

Mr. Weinland, who expects to be in San Francisco about the 1st of April, has been requested to call upon you for instruction in the manner of reading our instruments and recording observations, and I have the honor to request that you will satisfy yourself that he has been sufficiently instructed and has a thorough understanding of all the duties of an observer, before he leaves for his station.

Mr. Weinland has also been requested to compare his barometers with yours, to insure this office that they have not been injured in their transit to San Francisco.

Very respectfully, your obedient servant,

F. M. M. BEALL,  
*Second Lieutenant, Signal Corps.*

Lieut. ROBERT CRAIG,  
*Acting Signal Officer and Assistant,  
Merchants' Exchange, San Francisco, Cal.*

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K.

SIGNAL OFFICE, WAR DEPARTMENT,  
*Washington City, May 18, 1885.*

SIR: The Chief Signal Officer directs that you carefully instruct one of the enlisted men on duty at your station in the "indications" work, so that at any time when it may become necessary for you to leave the station on inspection trip, or for other reasons, the "indications" will be made by this man during your temporary absence.

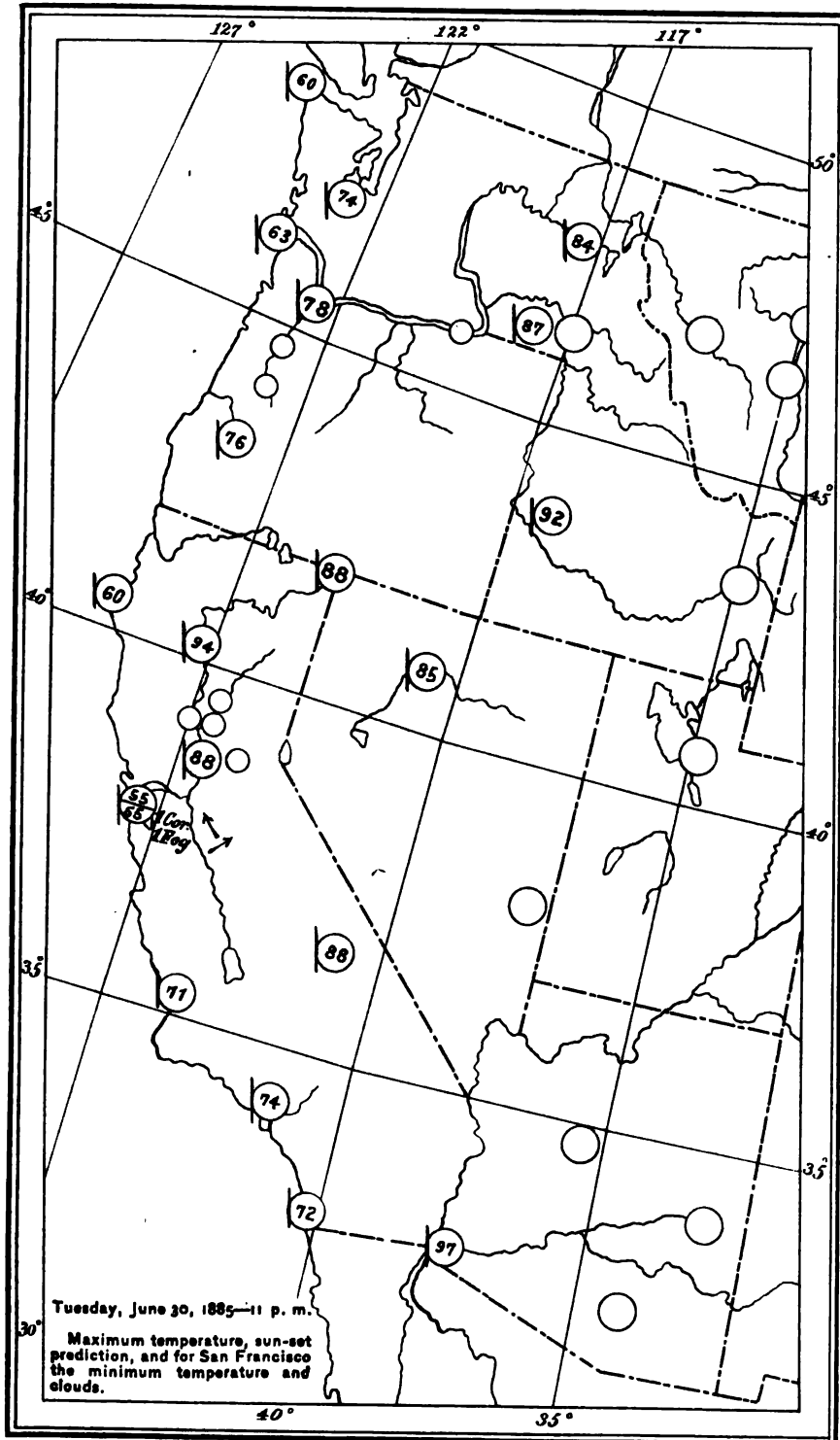
Very respectfully, your obedient servant,

B. M. PURSELL,  
*Second Lieutenant, Signal Corps, U. S. Army.*

First Lieut. ROBERT CRAIG,  
*Acting Signal Officer and Assistant,  
San Francisco, Cal.*

# WAR DEPARTMENT WEATHER MAP, SIGNAL SERVICE, U. S. ARMY.

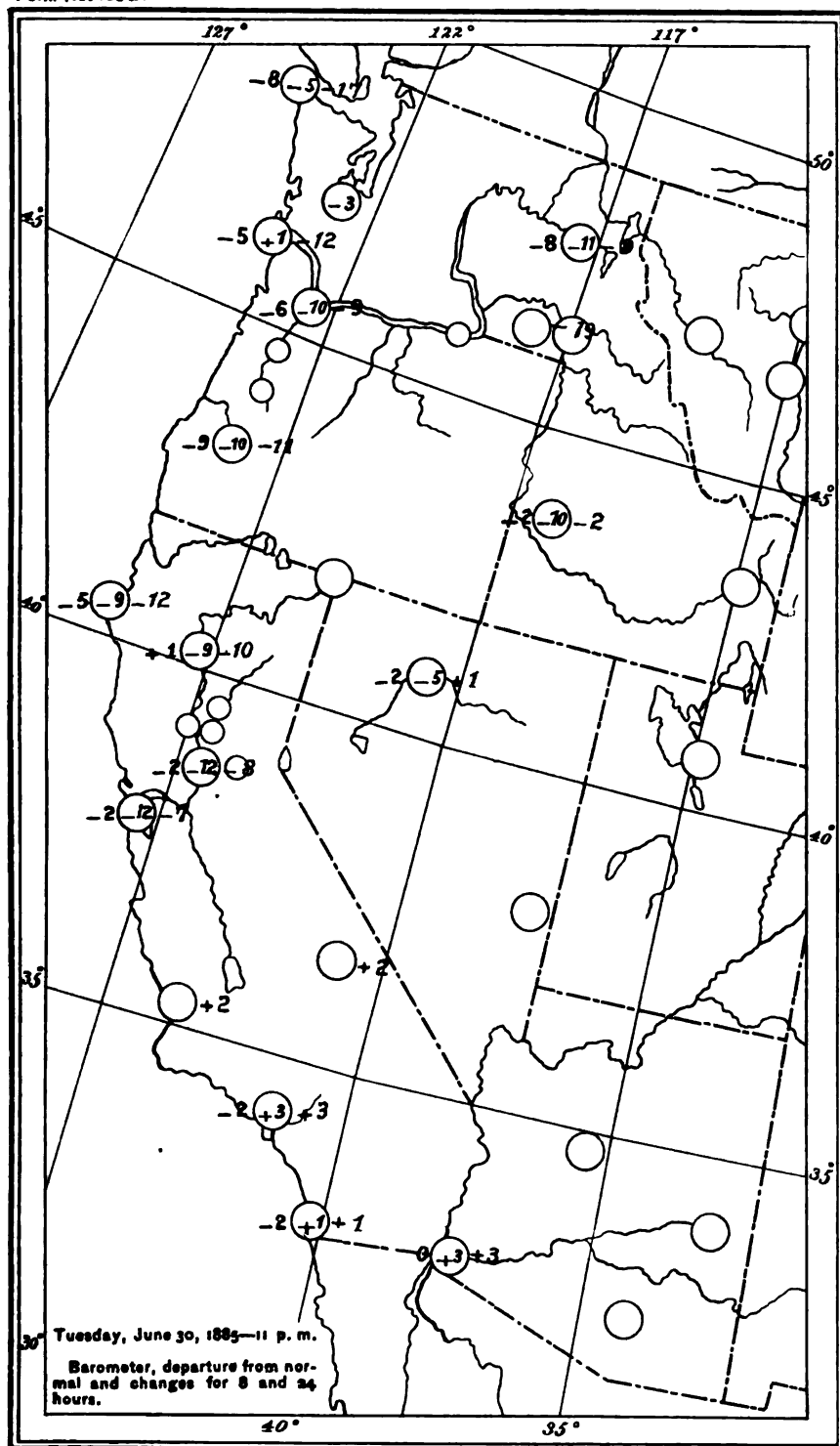
Form No. 106a.





# WAR DEPARTMENT WEATHER MAP, SIGNAL SERVICE, U. S. ARMY.

Form No. 106a.







## Form No. 106a.





## APPENDIX 4.

## REPORT OF THE STATIONS DIVISION.

SIGNAL OFFICE, WAR DEPARTMENT,  
*Washington City, June 30, 1885.*

SIR: I have the honor to report, in outline, the nature of the work performed by the Stations Division during the year ending this day.

The duties of this division are as varied and extensive as they are important, and their increase has been commensurate with the rapid strides taken by the service in meeting the wants of the people for a wider dissemination of the weather reports, weather signals, and information to be obtained only from the records of this office.

This division has general supervision of all paid observers of the Signal Service; of all special cautionary and cold-wave display stations; of the railway weather bulletins; of the instruction of enlisted men of the Signal Corps; of inspectors of the Signal Service, and of the receipt, record, and publication of reports from the above sources.

All correspondence with the enlisted men and civilians on duty at stations in relation to matters connected with their official duties as observers or displaymen is under the supervision of this division.

All directions to stations relative to changes of instruments or elevation of instruments, changes in instrumental corrections or reduction constants, otherwise than by general orders, are issued by this division.

All meteorological records from paid observers are here filed, and in case of destruction of the meteorological records of any station, by fire or otherwise, duplicate copies of those on file at this office are made and sent to the station in question.

The original records of observations, the monthly meteorological summaries, and other meteorological forms received from observers at stations, from displaymen, special river and special cotton-region observers, are here carefully examined for errors and irregularities, the necessary corrections applied, and after final action are filed in the division.

In all matters relating to the meteorological work of the various stations, their establishment, removal, or discontinuance, special instructions are issued and the necessary action taken.

The regular stations of the service displaying cautionary signals and the special display stations have continued in successful operation.

Signals on Lake Superior were discontinued on December 1, and on Lakes Michigan, Huron, Saint Clair, Erie, and Ontario on December 15, 1884.

The very limited balance of the appropriation available for the purpose, made it necessary to delay the opening of the special stations on the lakes until April 15, 1885; but, owing to the backwardness of the spring, the date named proved to be early enough for lake interests.

The number of stations remains about as last year, the appropriation being too small to display signals at any of the many additional points asked for by parties prominently interested in lake navigation.

During the year all of the special display stations have been inspected, and the reports of the inspectors were very generally satisfactory.

Requests from shipping-men for the resumption of night services of operators have been general, but there being no money for the purpose, the service could not take favorable action in the matter. At present night signals for special display stations are filed in the telegraph office by the observers in charge of the centers, for transmission to the displaymen the following morning.

The river and flood service has continued in active operation. It has been a source of great benefit to river interests generally, and the results of the large increase in the number of observations taken and reports made have been very gratifying.

Centers have been established, at which the river reports from special stations have been gathered in times of danger from flood, and rapidly disseminated through the sections of adjacent country liable to overflow, thus being the means of saving much valuable property and perhaps a number of lives.

My report on this subject explains the whole system of river and flood reports, and indicates how it has been extended and simplified during the year.

During the coming year it is expected that river gauges will be located, observers appointed, and observations commenced at many important points which the insufficient appropriations have heretofore prevented being done.

In the cotton-region system of reports, but few changes from last year have been made. Much pressure has been brought to bear on this office to open new stations at important points in the cotton-belt, but, as will be seen from my report on this subject, the meagerness of the appropriation for this branch of the service would not permit of any expenditures in this direction. On the contrary, observations were not begun until May 1 this year, in order that the money might be husbanded to operate this important service up to the end of the fiscal year, to avoid discontinuing any of the stations.

With a liberal sum from Congress for this work, the reports and their resulting advantages to all cotton interests could be extended indefinitely.

The cold-wave signal is a recent feature of this service; but one which at once made its way into public favor.

The first few warnings of approaching cold waves were received by the business community with such marked approval that this signal has become very popular, and all agricultural, commercial, and industrial interests are anxious to obtain the information of approaching cold weather.

My report on this signal shows what advancement has been made, and how the wants of the people for these reports have been met by the Signal Service; and also the gratifying results of the system.

With a limited appropriation for the purpose, much good could be accomplished, and many important centers of population furnished with cold-wave warnings which have of necessity been left untouched.

In my report on the railway weather bulletin service for the year, it will be seen that much good has been accomplished in the way of furnishing the weather predictions to the railroads of the country for transmission to, and display at, stations on their roads, in the interests of the traveling public and the resident population at the many hundreds of offices reached.

This railway service has been considerably extended during the year, so that fifty-one roads now post the daily weather reports at their various offices.

These reports are growing in favor, and are found to be very valuable in making shipments, moving freight, &c.

It is expected that during the ensuing year other roads will adopt this system, and that finally every railroad in the country will see the advantages to be derived from the weather forecasts furnished by this office.

Considerable has been done in the way of displaying weather and temperature signals from railroad trains. A number of roads have obtained flags or symbols, and are co-operating with this service in publishing the weather reports. On some roads the signals or symbols are displayed from the baggage-cars, and on others at the stations on the road. The indications are telegraphed to the superintendent, or other official charged with the work, and under his direction the proper symbols are displayed.

It is expected that a majority of the railroads of the country will rapidly adopt this system, which is so simple and inexpensive, the reports being sent from this office at the cost of the Signal Service.

In addition to the 49 regular appendices of the Annual Report of the Chief Signal Officer, meteorological data and tables have been compiled in the Stations Division, occupying time equal to the labor of one man for 966 working hours. These data have been for use in courts, for publication, for use of merchants' exchanges and boards of trade, for the Mississippi River Commission, for use of railroads, State boards of health, State weather services, and scientific purposes generally.

I am, sir, very respectfully, your obedient servant,

F. M. M. BEALL,  
*Second Lieutenant, Signal Corps.*

The CHIEF SIGNAL OFFICER OF THE ARMY,  
*Washington City.*

## APPENDIX 5.

No. 5.—Mean normal pressure, corrected for temperature and instrumental error only, at stations of the Signal Service, United States Army, for each month and the year. (Compiled from January, 1880, to December, 1884, inclusive, except at stations opened subsequent to the former date, with monthly constants for the reduction to sea-level of barometric observations made at Signal-Service stations.)

[Obtained by dividing the sum of the 7 a. m., a, and 11 p. m. (Washington time), normals by three.]

Stations.	Established.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
<b>New England:</b>														
Boston, Mass.	Apr. 1, 1873	30.975	30.976	30.967	30.782	30.916	30.844	30.815	30.811	30.901	30.988	30.970	30.916	30.904
Portland, Me.	Jan. 16, 1871	30.031	30.027	30.064	30.831	30.928	30.877	30.841	30.847	30.904	30.933	30.924	30.874	30.894
Mont Washington, N. H.	Dec. 1, 1870	30.432	30.465	30.360	30.498	30.736	30.818	30.833	30.837	30.869	30.907	30.854	30.847	30.847
Boston, Mass.	Nov. 1, 1870	30.975	30.972	30.780	30.776	30.663	30.823	30.794	30.805	30.933	30.977	30.975	30.918	30.881
Block Island, R. I.	Sept. 1, 1869	30.068	30.113	30.891	30.832	30.969	30.944	30.910	30.905	30.942	30.905	30.100	30.042	30.066
New Haven, Conn.	Dec. 10, 1872	30.018	30.019	30.837	30.832	30.888	30.853	30.830	30.925	30.954	30.905	30.920	30.907	30.923
New London, Conn.	Jan. 10, 1871	30.094	30.096	30.907	30.893	30.972	30.932	30.908	30.903	30.934	30.906	30.909	30.948	30.906
<b>Middle Atlantic States:</b>														
Albany, N. Y.	Dec. 22, 1873	30.064	30.032	30.886	30.856	30.904	30.870	30.846	30.944	30.982	30.938	30.952	30.911	30.839
New York City	Nov. 1, 1870	30.979	30.977	30.798	30.781	30.810	30.840	30.791	30.780	30.910	30.961	30.981	30.930	30.886
Philadelphia, Pa.	Jan. 1, 1871	30.051	30.045	30.870	30.848	30.890	30.864	30.850	30.834	30.965	30.922	30.957	30.908	30.931
Atlantic City, N. J.	Dec. 10, 1873	30.145	30.143	30.960	30.949	30.999	30.966	30.948	30.930	30.939	30.114	30.151	30.101	30.047
Barnegat City, N. J.	Dec. 10, 1873	30.130	30.131	30.949	30.937	30.968	30.953	30.933	30.919	30.947	30.102	30.135	30.086	30.034
Cape May, N. J.	May 24, 1871	30.128	30.131	30.944	30.939	30.974	30.943	30.936	30.914	30.911	30.096	30.136	30.087	30.032
Sandy Hook, N. J.	Dec. 10, 1873	30.128	30.125	30.982	30.930	30.982	30.948	30.920	30.910	30.947	30.106	30.134	30.084	30.030
Delaware Breakwater, Del.	Jan. 28, 1869	30.168	30.146	30.968	30.957	30.998	30.960	30.953	30.926	30.953	30.108	30.152	30.107	30.050
Baltimore, Md.	Jan. 1, 1871	30.146	30.139	30.971	30.954	30.996	30.950	30.938	30.911	30.942	30.105	30.150	30.106	30.042
Washington City	Nov. 1, 1870	30.077	30.067	30.905	30.885	30.915	30.884	30.879	30.850	30.981	30.936	30.984	30.942	30.978
Cape Henry, Va.	Dec. 15, 1873	30.158	30.163	30.989	30.974	30.912	30.976	30.974	30.925	30.981	30.114	30.168	30.128	30.062
Chincoteague, Va.	Mar. 16, 1880	30.150	30.109	30.973	30.973	30.911	30.977	30.971	30.934	30.963	30.119	30.165	30.137	30.061
Lynchburg, Va.	May 24, 1871	30.462	30.430	30.307	30.300	30.339	30.318	30.323	30.371	30.403	30.449	30.484	30.435	30.368
Norfolk, Va.	Jan. 1, 1871	30.146	30.151	30.973	30.961	30.900	30.968	30.967	30.914	30.946	30.103	30.153	30.117	30.050
<b>South Atlantic States:</b>														
Charlottesville, Va.	Oct. 6, 1878	30.206	30.303	30.157	30.153	30.161	30.167	30.176	30.202	30.239	30.280	30.318	30.277	30.229
Charlottesville, N. C.	Dec. 1, 1860	30.156	30.175	30.998	30.996	30.632	30.998	30.001	30.029	30.098	30.102	30.156	30.128	30.070
Kitty Hawk, N. C.	Jan. 16, 1875	30.183	30.192	30.021	30.013	30.051	30.017	30.014	30.055	30.088	30.130	30.180	30.144	30.091
Macon, Fort, N. C.	May 23, 1878	30.103	30.180	30.013	30.005	30.033	30.004	30.005	30.027	30.063	30.105	30.169	30.137	30.075
Smithville, N. C.	Oct. 15, 1875	30.148	30.165	30.004	30.991	30.016	30.992	30.995	30.007	30.043	30.086	30.143	30.125	30.060
Wilmington, N. C.	Jan. 1, 1871	30.122	30.134	30.972	30.958	30.965	30.959	30.964	30.965	30.019	30.068	30.121	30.098	30.032
Charleston, S. C.	Jan. 5, 1871	30.128	30.134	30.991	30.970	30.987	30.968	30.971	30.980	30.010	30.032	30.114	30.099	30.034
Augusta, Ga.	Nov. 2, 1870	30.020	30.018	30.880	30.855	30.865	30.819	30.855	30.865	30.908	30.956	30.921	30.900	30.923
Savannah, Ga.	Jan. 1, 1871	30.009	30.108	30.973	30.947	30.964	30.944	30.950	30.949	30.978	30.019	30.086	30.073	30.048
Jacksonville, Fla.	Sept. 11, 1871	30.142	30.116	30.036	30.995	30.993	30.996	30.013	30.990	30.009	30.036	30.110	30.114	30.048

No. 5.—Mean normal pressure, corrected for temperature and instrumental error only, at stations of the Signal Service, &amp;c.—Continued.

Stations.	Established.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
<b>Florida Peninsula:</b>														
Cedar Keys, Fla.	Nov. 7, 1879	Inches. 30.155	Inches. 30.155	Inches. 30.075	Inches. 30.033	Inches. 30.007	Inches. 30.019	Inches. 30.046	Inches. 30.005	Inches. 30.017	Inches. 30.036	Inches. 30.114	Inches. 30.128	Inches. 30.066
Key West, Fla.	Nov. 1, 1870	30.115	30.124	30.075	30.043	30.027	30.023	30.058	30.008	30.017	30.076	30.046	30.063	30.043
Sanford, Fla.	Sept. 1, 1882	30.155	30.068	30.031	30.030	29.958	29.962	29.991	29.966	29.961	29.994	30.048	30.094	30.014
<b>Eastern Gulf States:</b>														
Atlanta, Ga.	Sept. 25, 1878	29.982	29.986	29.968	29.854	29.877	29.876	29.895	29.897	29.926	29.938	29.998	29.965	29.924
Pensacola, Fla.	Oct. 27, 1879	30.154	30.144	30.052	30.006	29.992	29.989	30.022	29.989	30.010	30.045	30.130	30.124	30.055
Mobile, Ala.	Nov. 7, 1870	30.140	30.127	30.080	29.996	29.958	29.957	30.020	29.966	30.005	30.039	30.140	30.131	30.043
Montgomery, Ala.	Nov. 9, 1870	30.953	30.941	29.832	29.797	29.801	29.788	29.813	29.800	29.830	29.870	29.953	29.939	29.859
Vicksburg, Miss.	Sept. 10, 1871	29.970	29.893	29.805	29.759	29.754	29.761	29.800	29.780	29.805	29.838	29.930	29.902	29.829
New Orleans, La.	Nov. 1, 1870	30.099	30.083	30.002	29.933	29.941	29.945	29.966	29.961	29.966	29.998	30.087	30.079	30.008
<b>Western Gulf States:</b>														
Shreveport, La.	Sept. 3, 1871	29.927	29.885	29.807	29.743	29.740	29.755	29.783	29.784	29.807	29.834	29.933	29.905	29.828
Fort Smith, Ark.	June 1, 1882	29.786	29.682	29.550	29.448	29.483	29.487	29.527	29.560	29.561	29.583	29.680	29.620	29.576
Little Rock, Ark.	July 1, 1879	29.842	29.805	29.715	29.654	29.658	29.655	29.700	29.702	29.726	29.757	29.827	29.743	29.743
Galveston, Tex.	Apr. 19, 1871	30.104	30.079	30.000	29.941	29.927	29.942	29.980	29.963	29.969	30.003	30.096	30.082	30.008
Indianola, Tex.	May 1, 1872	30.119	30.097	29.997	29.935	29.923	29.938	29.981	29.965	29.969	30.008	30.107	30.096	30.010
Palestine, Tex.	Dec. 3, 1881	29.666	29.581	29.500	29.417	29.441	29.453	29.497	29.502	29.503	29.510	29.607	29.565	29.521
<b>Rio Grande Valley:</b>														
Brownsville, Tex.	Aug. 25, 1875	30.072	30.032	29.942	29.873	29.866	29.889	29.939	29.915	29.917	29.946	30.060	30.043	29.957
Rio Grande City, Tex.	May 28, 1875	30.041	30.017	29.782	29.719	29.694	29.721	29.753	29.747	29.760	29.826	29.927	29.904	29.800
<b>Ohio Valley and Tennessee:</b>														
Chattanooga, Tenn.	Jan. 8, 1879	29.355	29.344	29.226	29.203	29.224	29.217	29.240	29.247	29.277	29.314	29.373	29.339	29.290
Knoxville, Tenn.	Jan. 1, 1871	29.136	29.128	29.015	29.022	29.022	29.018	29.045	29.055	29.066	29.117	29.165	29.125	29.200
Memphis, Tenn.	Feb. 28, 1871	29.631	29.601	29.703	29.650	29.682	29.650	29.701	29.697	29.730	29.760	29.845	29.812	29.726
Nashville, Tenn.	Nov. 1, 1870	29.451	29.451	29.451	29.414	29.420	29.409	29.454	29.448	29.483	29.524	29.594	29.562	29.482
Louisville, Ky.	Sept. 1, 1871	29.581	29.536	29.423	29.402	29.417	29.403	29.442	29.437	29.487	29.523	29.583	29.550	29.482
Indianapolis, Ind.	Feb. 10, 1871	29.298	29.274	29.187	29.157	29.177	29.161	29.206	29.202	29.250	29.285	29.320	29.291	29.237
Cincinnati, Ohio	Nov. 1, 1870	29.493	29.446	29.367	29.341	29.358	29.340	29.374	29.402	29.429	29.484	29.516	29.473	29.417
Columbus, Ohio	July 1, 1878	29.262	29.245	29.137	29.117	29.146	29.129	29.158	29.198	29.224	29.255	29.326	29.243	29.200
Pittsburg, Pa.	Nov. 1, 1870	29.302	29.295	29.172	29.156	29.168	29.174	29.193	29.245	29.261	29.305	29.326	29.288	29.243
<b>Lower Lakes:</b>														
Duluth, Minn.	Nov. 1, 1870	29.328	29.322	29.217	29.206	29.227	29.219	29.218	29.241	29.217	29.248	29.328	29.281	29.276
Superior, Wis.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
Marquette, Mich.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
Rochester, N. Y.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
Buffalo, N. Y.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
<b>Other Stations:</b>														
San Francisco, Cal.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Diego, Cal.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Jose, Cal.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Luis Obispo, Cal.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Bernardino, Cal.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Gabriel, Cal.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Antonio, Tex.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Marcos, Tex.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Marcos, Tex.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Marcos, Tex.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Marcos, Tex.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Marcos, Tex.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Marcos, Tex.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Marcos, Tex.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Marcos, Tex.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Marcos, Tex.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Marcos, Tex.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Marcos, Tex.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Marcos, Tex.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Marcos, Tex.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Marcos, Tex.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Marcos, Tex.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Marcos, Tex.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Marcos, Tex.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Marcos, Tex.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Marcos, Tex.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Marcos, Tex.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Marcos, Tex.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Marcos, Tex.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Marcos, Tex.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Marcos, Tex.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Marcos, Tex.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Marcos, Tex.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Marcos, Tex.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Marcos, Tex.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	29.328	29.281	29.276
San Marcos, Tex.	Nov. 1, 1870	29.344	29.327	29.214	29.204	29.227	29.216	29.218	29.241	29.217	29.248	2		

## Upper Lakes:

Alpena, Mich.	Sept. 10, 1872	29 371	29 375	29 330	29 316	29 331	29 290	29 391	29 803	29 365	29 392	29 803	29 377	29 348
Eastland, Mich.	May 24, 1871	29 866	29 368	29 332	29 314	29 802	29 270	29 281	29 344	29 392	29 360	29 803	29 347	29 330
Grand Haven, Mich.	May 24, 1871	29 392	29 377	29 319	29 300	29 800	29 281	29 318	29 349	29 392	29 360	29 800	29 347	29 330
Marquette City, Mich.	Aug. 20, 1882	29 869	29 344	29 314	29 318	29 277	29 828	29 256	29 359	29 392	29 360	29 800	29 347	29 330
Marquette, Mich.	May 1, 1871	29 284	29 279	29 252	29 235	29 252	29 210	29 210	29 256	29 290	29 290	29 279	29 247	29 236
Port Huron, Mich.	July 25, 1874	29 383	29 371	29 292	29 265	29 305	29 274	29 282	29 344	29 365	29 357	29 801	29 347	29 337
Chicago, Ill.	Nov. 1, 1870	29 356	29 356	29 285	29 256	29 301	29 242	29 242	29 281	29 325	29 357	29 801	29 347	29 337
Milwaukee, Wis.	Nov. 1, 1870	29 312	29 312	29 241	29 219	29 218	29 197	29 218	29 278	29 324	29 359	29 811	29 347	29 337
Duluth, Minn.	Nov. 1, 1870	29 321	29 304	29 292	29 280	29 240	29 212	29 241	29 289	29 371	29 359	29 821	29 347	29 337
Upper Mississippi Valley:														
Saint Paul, Minn.	Nov. 1, 1870	29 185	29 169	29 186	29 083	29 070	29 055	29 099	29 128	29 107	29 140	29 172	29 190	29 128
La Crosse, Wis.	Oct. 15, 1870	29 225	29 271	29 225	29 174	29 164	29 149	29 187	29 254	29 218	29 254	29 277	29 277	29 227
Davenport, Iowa	May 24, 1871	29 452	29 417	29 352	29 290	29 304	29 283	29 336	29 401	29 368	29 401	29 447	29 437	29 372
Des Moines, Iowa	Aug. 1, 1878	29 211	29 179	29 131	29 050	29 055	29 039	29 104	29 129	29 148	29 148	29 201	29 208	29 129
Dubuque, Iowa	July 10, 1873	29 373	29 353	29 244	29 244	29 246	29 228	29 277	29 340	29 311	29 340	29 374	29 372	29 310
Keokuk, Iowa	July 16, 1871	29 456	29 349	29 284	29 284	29 291	29 275	29 386	29 360	29 361	29 400	29 445	29 445	29 369
Cairo, Ill.	June 1, 1871	29 800	29 761	29 666	29 612	29 619	29 609	29 656	29 663	29 727	29 727	29 780	29 780	29 699
Springfield, Ill.	July 1, 1870	29 832	29 448	29 448	29 382	29 391	29 382	29 434	29 391	29 370	29 415	29 436	29 436	29 370
St. Louis, Mo.	Nov. 1, 1870	29 540	29 499	29 415	29 360	29 371	29 359	29 412	29 429	29 441	29 461	29 517	29 517	29 448
Missouri Valley:														
Leavenworth, Kans.	May 21, 1871	29 245	29 211	29 137	29 060	29 068	29 056	29 124	29 144	29 134	29 170	29 247	29 245	29 138
Omaha, Nebr.	Nov. 1, 1870	29 558	29 512	29 456	29 375	29 381	29 368	29 442	29 466	29 544	29 579	29 644	29 644	29 582
Bennett, Fort, Dak.	Dec. 22, 1879	29 478	29 478	29 431	29 370	29 381	29 301	29 342	29 352	29 370	29 476	29 476	29 476	29 401
Huron, Dak.	July 1, 1881	29 096	29 665	29 636	29 555	29 542	29 542	29 586	29 586	29 575	29 600	29 659	29 678	29 614
Yankton, Dak.	Apr. 1, 1873	29 777	29 769	29 720	29 643	29 637	29 621	29 688	29 702	29 681	29 711	29 795	29 795	29 711
Extreme Northwest:														
Merhead, Minn.	Jan. 1, 1881	29 103	29 078	29 038	29 983	29 981	29 909	29 950	29 973	29 959	29 988	29 986	29 967	29 905
Saint Vincent, Minn.	Sept. 5, 1890	29 242	29 221	29 196	29 101	29 113	29 041	29 067	29 068	29 070	29 117	29 122	29 203	29 148
Blancak, Dak.	Sept. 15, 1874	29 192	29 189	29 188	29 152	29 109	29 089	29 151	29 167	29 149	29 160	29 223	29 228	29 166
Buford, Fort, Dak.	Oct. 23, 1878	29 970	29 965	29 961	29 928	29 902	29 864	29 924	29 986	29 935	29 927	29 903	29 903	29 943
Northern Slope:														
Asinabunga, Fort, Mont.	Oct. 6, 1879	29 157	29 150	29 123	29 105	29 118	29 089	29 147	29 160	29 140	29 113	29 200	29 167	29 141
Benton, Fort, Mont.	Oct. 1, 1879	29 233	29 207	29 185	29 151	29 174	29 126	29 161	29 170	29 196	29 196	29 260	29 230	29 198
Custer, Fort, Mont.	Dec. 15, 1878	29 787	29 774	29 776	29 780	29 778	29 748	29 818	29 829	29 834	29 818	29 885	29 854	29 803
Helena, Mont.	Oct. 5, 1879	29 833	29 811	29 800	29 780	29 810	29 802	29 831	29 879	29 863	29 831	29 897	29 859	29 833
Magnums, Fort, Mont.	July 14, 1882	29 500	29 504	29 513	29 479	29 557	29 562	29 632	29 632	29 632	29 632	29 632	29 632	29 548
Shaw, Fort, Mont.	Apr. 1, 1880	29 348	29 328	29 328	29 285	29 312	29 292	29 369	29 377	29 378	29 448	29 541	29 541	29 548
Deadwood, Dak.	Dec. 25, 1877	29 238	29 257	29 274	29 296	29 334	29 350	29 440	29 440	29 440	29 440	29 440	29 440	29 440
Cheyenne, Wyo.	Nov. 1, 1870	29 688	29 668	29 603	29 518	29 585	29 504	29 526	29 585	29 585	29 585	29 585	29 585	29 585
North Platte, Nebr.	Sept. 18, 1874	29 082	29 080	29 037	29 996	29 019	29 022	29 097	29 112	29 081	29 085	29 140	29 107	29 073
Middle Slope:														
Denver, Colo.	Nov. 19, 1871	29 661	29 664	29 613	29 647	29 693	29 723	29 820	29 835	29 794	29 747	29 792	29 792	29 727
Pike's Peak, Colo.	Nov. 1, 1873	29 469	29 469	29 469	29 469	29 469	29 469	29 469	29 469	29 469	29 469	29 469	29 469	29 469
West Las Animas, Colo.	Oct. 1, 1871	29 047	29 015	29 040	29 913	29 973	29 931	29 065	29 101	29 058	29 031	29 092	29 013	29 029
Dodge City, Kans.	Sept. 15, 1874	29 277	29 277	29 277	29 277	29 277	29 277	29 277	29 277	29 277	29 277	29 277	29 277	29 277
Elliott, Fort, Tex.	Nov. 29, 1879	29 279	29 261	29 223	29 167	29 175	29 181	29 238	29 240	29 240	29 240	29 240	29 240	29 240
Southern Slope:														
Sill, Fort, Ind. T.	June 24, 1875	29 850	29 863	29 777	29 699	29 693	29 690	29 763	29 770	29 783	29 815	29 907	29 903	29 789
Concho, Fort, Tex.	Oct. 10, 1875	29 190	29 186	29 090	29 033	29 010	29 015	29 097	29 111	29 121	29 131	29 209	29 219	29 136
Davis, Fort, Tex.	Dec. 24, 1877	29 185	29 180	29 143	29 141	29 141	29 147	29 202	29 250	29 250	29 257	29 316	29 316	29 250
Stockton, Fort, Tex.	Feb. 20, 1876	29 042	29 014	29 964	29 923	29 889	29 922	29 965	29 965	29 965	29 965	29 965	29 965	29 965

No. 5.—Mean normal pressure, corrected for temperature and instrumental error only, at stations of the Signal Service, &amp;c.—Continued.

Stations.	Established.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
<b>Southern Plateau:</b>														
El Paso, Tex.	Nov. 5, 1877	29.200	29.201	29.224	28.192	28.190	28.186	28.240	29.205	28.270	28.262	28.321	28.303	28.248
Apache, Fort, Ariz.	Oct. 9, 1877	29.009	29.009	29.009	28.972	28.966	28.963	28.967	28.973	28.935	28.931	28.958	28.945	28.925
Grant, Fort, Ariz.	Nov. 1, 1875	28.238	28.216	28.179	28.167	28.164	28.203	28.245	28.241	28.257	28.234	28.256	28.238	28.219
Prescott, Ariz.	Nov. 10, 1873	28.717	28.703	28.672	28.639	28.680	28.714	28.703	28.745	28.758	28.730	28.755	28.728	28.724
Thomas, Camp, Ariz.	Sept. 22, 1877	27.367	27.271	27.226	27.163	27.138	27.124	27.122	27.184	27.192	27.221	27.207	27.302	27.219
Yuma, Ariz.	Nov. 18, 1873	29.939	29.913	29.827	29.760	29.873	29.623	29.653	29.647	29.604	29.754	29.682	29.876	29.766
<b>Middle Plateau:</b>														
Winona, Nov. 1	July 1, 1877	25.644	25.613	25.598	25.528	25.552	25.540	25.608	25.573	25.608	25.627	25.723	25.642	25.607
Salt Lake City, Utah	Mar. 10, 1874	25.03	25.665	25.012	25.532	25.579	25.576	25.644	25.641	25.639	25.653	25.753	25.673	25.640
<b>Northern Plateau:</b>														
Boise City, Idaho	July 1, 1877	27.282	27.243	27.186	27.114	27.120	27.106	27.156	27.134	27.174	27.214	27.243	27.250	27.194
Lewisville, Idaho	July 1, 1879	29.750	29.307	29.301	29.130	29.157	29.096	29.141	29.120	29.100	29.215	29.380	29.289	29.213
Dayton, Wash.	July 1, 1870	28.393	28.335	28.253	28.223	28.247	28.204	28.256	28.253	28.257	28.201	28.304	28.336	28.284
Spokane Falls, Wash.	Feb. 9, 1881	28.076	28.029	27.974	27.919	27.932	27.908	27.907	27.964	27.945	27.934	28.080	28.082	27.884
<b>North Pacific Coast:</b>														
Cambly, Fort, Wash.	Sept. 1, 1883	29.890	29.822	29.731	29.744	29.815	29.772	29.856	29.816	29.799	29.827	29.875	29.803	29.813
Olympia, Wash.	July 1, 1877	29.040	29.047	29.099	29.041	29.018	29.979	29.028	29.999	29.999	29.993	29.111	29.960	29.010
Tatoosh Island, Wash.	Oct. 1, 1883	29.878	29.817	29.819	29.838	29.829	29.878	29.862	29.823	29.874	29.808	29.842	29.810	29.808
Portland, Oreg.	Nov. 1, 1871	30.016	30.050	30.063	30.021	30.060	30.050	30.091	30.062	30.060	30.066	30.104	30.063	30.091
Roseburg, Oreg.	July 15, 1877	29.592	29.572	29.508	29.459	29.501	29.477	29.508	29.481	29.483	29.521	29.626	29.494	29.519
<b>Middle Pacific Coast:</b>														
Cape Mendocino, Cal.	July 27, 1882	29.458	29.346	29.269	29.315	29.315	29.323	29.306	29.303	29.302	29.331	29.368	29.378	29.384
Red Bluff, Cal.	July 1, 1877	29.768	29.607	29.607	29.633	29.599	29.539	29.535	29.517	29.568	29.631	29.702	29.729	29.643
Sacramento, Cal.	July 1, 1877	30.075	30.075	30.040	30.040	30.063	30.063	30.033	30.033	30.042	30.031	30.054	30.035	30.044
San Francisco, Cal.	Mar. 8, 1871	30.097	30.069	30.099	30.084	30.044	30.013	30.016	30.091	30.087	30.066	30.062	30.086	30.061
<b>South Pacific Coast:</b>														
Los Angeles, Cal.	July 1, 1877	29.735	29.729	29.686	29.681	29.601	29.571	29.598	29.560	29.568	29.611	29.686	29.685	29.641
San Diego, Cal.	Nov. 1, 1871	30.031	30.040	29.963	29.960	29.898	29.867	29.867	29.847	29.843	29.902	29.972	29.964	29.936

1 Observations discontinued June 15, 1883, and recommenced December 1, 1884.



*Monthly constants for the reduction to sea-level of barometric observations made at Signal Service stations.*

[The column headed "Altitude" contains the elevation above sea-level of the barometers at the several stations as adopted by this office. The letter B denotes that the altitude has been obtained from barometric readings. The values given in this column will be used on all forms instead of values heretofore in use.]

Station.	Altitude.	Reduction constant for each month.											
		Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Albany, N. Y.	83	0.10	0.10	0.10	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.10
Alexander, Fort, Alaska	38	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05
Alpena, Mich.	609	0.71	0.71	0.70	0.69	0.68	0.65	0.64	0.64	0.65	0.67	0.70	0.71
Apache, Fort, Ariz.	5050 B	5.12	5.10	5.02	4.92	4.82	4.75	4.74	4.72	4.80	4.90	5.10	5.08
Assinaboine, Fort, Mont.	2720 B	3.05	3.05	3.02	2.91	2.85	2.80	2.74	2.70	2.86	2.93	2.99	3.04
Atlanta, Ga.	1129	1.23	1.22	1.21	1.19	1.17	1.15	1.15	1.15	1.17	1.19	1.22	1.23
Atlantic City, N. J.	13	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Augusta, Ga.	183	0.20	0.20	0.20	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.20	0.20
Baltimore, Md.	45	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Barnegat City, N. J.	22	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Behring's Island, Behring Sea	22	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Bennett, Fort, Dak.	1510 B	1.74	1.73	1.70	1.64	1.56	1.54	1.54	1.54	1.59	1.63	1.69	1.76
Benton, Fort, Mont.	2681 B	2.97	2.99	2.97	2.85	2.78	2.76	2.70	2.78	2.83	2.90	2.95	2.99
Bismarck, Dak.	1694	2.00	1.98	1.92	1.88	1.79	1.76	1.73	1.76	1.80	1.88	1.93	2.02
Block Island, R. I.	27	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Boise City, Idaho	2750 B	2.83	2.96	2.92	2.84	2.84	2.78	2.72	2.75	2.77	2.86	2.94	2.98
Boston, Mass.	122	0.14	0.14	0.14	0.14	0.14	0.13	0.13	0.13	0.13	0.14	0.14	0.14
Brownsville, Tex.	67	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Buffalo, N. Y.	690	0.79	0.79	0.78	0.77	0.74	0.73	0.72	0.72	0.73	0.75	0.77	0.79
Buford, Fort, Dak.	1930 B	2.23	2.21	2.16	2.10	2.00	1.99	1.96	1.98	2.02	2.10	2.16	2.27
Cairo, Ill.	377	0.42	0.42	0.42	0.41	0.40	0.39	0.39	0.39	0.40	0.42	0.42	0.42
Canby, Fort, Wash.	179	0.20	0.20	0.20	0.20	0.20	0.19	0.19	0.19	0.20	0.20	0.20	0.20
Cape Henry, Va.	16	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Cape May, N. J.	27	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Cape Mendocino, Cal.	637	0.70	0.70	0.69	0.69	0.68	0.68	0.68	0.68	0.68	0.69	0.70	0.70
Cedar Keys, Fla.	22	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Charleston, S. C.	62	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06
Charlotte, N. C.	808	0.89	0.89	0.88	0.86	0.84	0.83	0.83	0.84	0.84	0.86	0.88	0.89
Chattanooga, Tenn.	793	0.86	0.86	0.85	0.83	0.81	0.81	0.80	0.81	0.81	0.83	0.85	0.86
Cheyenne, Wyo.	6105	6.27	6.27	6.20	6.02	5.89	5.76	5.70	5.72	5.83	6.04	6.23	6.30
Chicago, Ill.	661	0.75	0.75	0.74	0.73	0.70	0.69	0.69	0.69	0.69	0.71	0.74	0.76
Chincoteague, Va.	8	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cincinnati, Ohio	620	0.69	0.69	0.69	0.67	0.65	0.65	0.64	0.64	0.65	0.66	0.69	0.70
Cleveland, Ohio	690	0.78	0.79	0.78	0.76	0.73	0.73	0.72	0.72	0.72	0.74	0.77	0.79
Coleman City, Tex.	1709	1.88	1.88	1.85	1.82	1.79	1.75	1.74	1.74	1.70	1.82	1.89	1.90
Columbus, Ohio	805	0.90	0.90	0.89	0.87	0.84	0.84	0.83	0.82	0.84	0.89	0.89	0.91
Concho, Fort, Tex.	1900 B	2.02	2.02	1.97	1.94	1.90	1.87	1.88	1.86	1.90	1.95	2.01	2.02
Custer, Fort, Mont.	3040 B	3.38	3.36	3.33	3.18	3.10	3.06	3.02	3.06	3.12	3.24	3.32	3.40
Davenport, Iowa.	615	0.71	0.70	0.69	0.67	0.64	0.64	0.63	0.63	0.65	0.69	0.69	0.71
Davis, Fort, Tex.	4928 B	4.97	4.95	4.87	4.78	4.71	4.60	4.63	4.64	4.69	4.84	4.89	4.93
Dayton, Wash.	1667 B	1.81	1.82	1.82	1.76	1.76	1.75	1.72	1.72	1.75	1.79	1.79	1.84
Deadwood, Dak.	4600 B	4.95	4.92	4.84	4.69	4.62	4.44	4.43	4.44	4.56	4.68	4.84	4.99
Delaware Breakwater, Del.	20	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Denver, Colo.	5294	5.52	5.54	5.44	5.27	5.10	5.04	5.01	5.02	5.11	5.26	5.50	5.52
Des Moines, Iowa	849	0.97	0.97	0.96	0.93	0.89	0.88	0.88	0.88	0.89	0.92	0.93	0.96
Detroit, Mich.	661	0.76	0.75	0.75	0.73	0.70	0.69	0.69	0.69	0.69	0.71	0.74	0.76
Dodge City, Kans.	2517	2.75	2.74	2.73	2.64	2.55	2.51	2.50	2.48	2.55	2.63	2.74	2.80
Dubuque, Iowa.	665	0.77	0.76	0.75	0.73	0.70	0.69	0.69	0.69	0.70	0.72	0.75	0.77
Duluth, Minn.	672	0.79	0.79	0.77	0.75	0.73	0.71	0.70	0.70	0.72	0.74	0.77	0.80
Eastport, Me.	61	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.07	0.07	0.07	0.07	0.07
Elliot, Fort, Tex.	2850 B	2.93	2.90	2.83	2.78	2.70	2.67	2.64	2.64	2.69	2.79	2.93	2.96
El Paso, Tex.	3764 B	3.88	3.88	3.80	3.74	3.64	3.59	3.60	3.60	3.63	3.74	3.85	3.86
Erie, Pa.	691	0.77	0.77	0.77	0.75	0.72	0.72	0.71	0.71	0.71	0.73	0.76	0.77
Escanaba, Mich.	613	0.72	0.72	0.71	0.69	0.66	0.65	0.64	0.64	0.66	0.67	0.70	0.72
Fort Smith, Ark.	451	0.50	0.50	0.49	0.48	0.47	0.46	0.46	0.46	0.47	0.48	0.49	0.50
Galveston, Tex.	40	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Grand Haven, Mich.	620	0.71	0.71	0.70	0.69	0.66	0.65	0.65	0.65	0.66	0.67	0.70	0.71
Grant, Fort, Ariz.	4856 B	4.90	4.89	4.83	4.73	4.61	4.54	4.57	4.57	4.60	4.70	4.84	4.88
Hatteras, N. C.	12	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Helena, Mont.	4044 B	4.38	4.35	4.32	4.21	4.12	4.07	4.01	4.04	4.12	4.25	4.33	4.33
Huron, Dak.	1305	1.54	1.52	1.48	1.45	1.35	1.34	1.32	1.34	1.38	1.43	1.48	1.54
Indianapolis, Ind.	753	0.84	0.85	0.84	0.82	0.79	0.78	0.77	0.77	0.78	0.80	0.84	0.85
Indianola, Tex.	26	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Jacksonville, Fla.	43	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05
Keokuk, Iowa.	618	0.70	0.70	0.69	0.67	0.65	0.64	0.63	0.63	0.65	0.67	0.69	0.71
Key West, Fla.	20	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Kitty Hawk, N. C.	9	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Knoxville, Tenn.	980	1.08	1.08	1.06	1.04	1.02	1.01	1.00	1.01	1.02	1.04	1.07	1.08
La Crosse, Wis.	725	0.84	0.84	0.82	0.80	0.76	0.76	0.75	0.75	0.77	0.79	0.82	0.85
Leavenworth, Kans.	842	0.96	0.95	0.94	0.91	0.88	0.87	0.86	0.86	0.88	0.90	0.94	0.96
Lewiston, Idaho.	790 B	0.87	0.87	0.86	0.85	0.84	0.82	0.81	0.81	0.83	0.85	0.87	0.89

Monthly constants for the reduction to sea-level of barometric observations, &c.—Continued.

Station.	Altitude.	Reduction constant for each month.											
		Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Little Rock, Ark.	299	0.33	0.33	0.33	0.32	0.31	0.31	0.31	0.31	0.31	0.32	0.33	0.33
Los Angeles, Cal.	871	0.40	0.40	0.40	0.40	0.40	0.39	0.39	0.39	0.39	0.40	0.40	0.40
Louisville, Ky.	580	0.59	0.59	0.59	0.57	0.55	0.55	0.55	0.55	0.55	0.57	0.59	0.60
Lynchburg, Va.	622	0.72	0.72	0.72	0.71	0.68	0.67	0.67	0.67	0.68	0.69	0.72	0.73
Mackinaw City, Mich.	605	0.70	0.70	0.70	0.68	0.65	0.64	0.64	0.64	0.65	0.67	0.69	0.70
Macon, Fort, N. C.	11	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Maginnia, Fort, Mont.	4940 B	4.77	4.75	4.60	4.50	4.41	4.33	4.31	4.31	4.40	4.54	4.80	4.63
Marquette, Mich.	678	0.78	0.78	0.77	0.75	0.72	0.72	0.71	0.71	0.72	0.74	0.77	0.78
Memphis, Tenn.	321	0.86	0.85	0.85	0.84	0.83	0.82	0.83	0.83	0.84	0.84	0.85	0.86
Milwaukee, Wis.	607	0.80	0.80	0.79	0.77	0.74	0.74	0.73	0.73	0.74	0.76	0.79	0.81
Mobile, Ala.	85	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Montgomery, Ala.	219	0.24	0.24	0.24	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.24	0.24
Moorhead, Minn.	923	1.11	1.10	1.08	1.03	0.98	0.97	0.96	0.97	0.99	1.02	1.06	1.11
Mount Washington, N. H.	6279	6.63	6.62	6.52	6.41	6.18	6.12	6.07	6.08	6.15	6.34	6.56	6.68
Myer, Fort, Va.	267	0.30	0.30	0.30	0.29	0.28	0.28	0.28	0.28	0.28	0.29	0.30	0.30
Nashville, Tenn.	549	0.61	0.61	0.60	0.58	0.57	0.56	0.56	0.56	0.57	0.58	0.60	0.61
New Haven, Conn.	107	0.12	0.12	0.12	0.12	0.12	0.11	0.11	0.11	0.11	0.12	0.12	0.12
New London, Conn.	47	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
New Orleans, La.	52	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06
New York City.	164	0.19	0.19	0.18	0.18	0.18	0.17	0.17	0.17	0.17	0.18	0.18	0.19
Norfolk, Va.	30	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
North Platte, Nebr.	2841	3.12	3.10	3.06	2.96	2.87	2.80	2.80	2.80	2.88	2.96	3.08	3.16
Olympia, Wash.	36	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Omaha, Nebr.	1113	1.27	1.27	1.25	1.21	1.16	1.14	1.13	1.14	1.17	1.20	1.24	1.29
Oswego, N. Y.	334	0.38	0.38	0.37	0.37	0.36	0.35	0.35	0.35	0.36	0.38	0.37	0.38
Palestine, Tex.	538	0.58	0.58	0.57	0.56	0.55	0.54	0.54	0.54	0.55	0.56	0.57	0.58
Penascola, Fla.	30	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Philadelphia, Pa.	117	0.13	0.13	0.13	0.13	0.12	0.12	0.12	0.12	0.12	0.13	0.13	0.13
Pike's Peak, Colo.	14184	12.70	12.72	12.59	12.28	12.06	11.82	11.78	11.79	11.98	12.28	12.66	12.06
Pittsburg, Pa.	766	0.85	0.86	0.85	0.83	0.80	0.79	0.79	0.79	0.79	0.82	0.85	0.86
Poplar River, Mont.	2030 B	2.35	2.35	2.30	2.20	2.12	2.10	2.06	2.08	2.15	2.22	2.29	2.36
Port Huron, Mich.	633	0.73	0.73	0.72	0.70	0.68	0.67	0.66	0.66	0.67	0.69	0.72	0.73
Portland, Me.	45	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Portland, Oreg.	67	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Prescott, Ariz.	5369	5.48	5.41	5.39	5.27	5.14	5.06	5.08	5.02	5.14	5.20	5.39	5.43
Provincetown, Mass.	20	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Red Bluff, Cal.	832	0.37	0.37	0.37	0.36	0.35	0.35	0.34	0.35	0.35	0.36	0.37	0.37
Rio Grande City, Tex.	220 B	0.25	0.25	0.24	0.24	0.24	0.24	0.23	0.24	0.24	0.24	0.25	0.25
Rochester, N. Y.	621	0.71	0.71	0.70	0.69	0.66	0.65	0.65	0.65	0.65	0.67	0.70	0.71
Roeseburg, Oreg.	523	0.58	0.58	0.57	0.57	0.56	0.56	0.55	0.55	0.56	0.57	0.58	0.58
Sacramento, Cal.	64	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Saint Louis, Mo.	571	0.65	0.65	0.64	0.62	0.60	0.59	0.59	0.59	0.60	0.61	0.64	0.65
Saint Michael's, Fort, Alaska.	80	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04
Saint Paul, Minn.	801	0.94	0.93	0.91	0.88	0.84	0.84	0.83	0.83	0.85	0.87	0.91	0.95
Saint Vincent, Minn.	804	0.98	0.97	0.94	0.91	0.86	0.85	0.84	0.85	0.87	0.90	0.93	0.99
Salt Lake City, Utah.	4348	4.57	4.56	4.52	4.37	4.32	4.22	4.18	4.19	4.25	4.40	4.57	4.54
San Diego, Cal.	67	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Sandusky, Ohio.	639	0.72	0.72	0.72	0.70	0.67	0.67	0.66	0.66	0.67	0.69	0.72	0.73
Sandy Hook, N. J.	28	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Sanford, Fla.	35 B	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
San Francisco, Cal.	60	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Savannah, Ga.	87	0.10	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.10
Shaw, Fort, Mont.	3550 B	3.86	3.85	3.80	3.67	3.60	3.57	3.51	3.53	3.61	3.70	3.82	3.83
Shreveport, La.	227	0.25	0.25	0.25	0.24	0.24	0.23	0.23	0.23	0.24	0.24	0.25	0.25
Sill, Fort, Ind. T.	1200 B	1.83	1.81	1.29	1.24	1.22	1.20	1.20	1.18	1.22	1.26	1.31	1.33
Sitka, Alaska.	63	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07
Smithville, N. C.	34	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.04	0.04	0.04	0.04
Spokane Falls, Wash.	1006	2.14	2.13	2.13	2.06	2.05	2.04	1.96	2.00	2.04	2.08	2.08	2.13
Springfield, Ill.	644	0.73	0.73	0.72	0.70	0.67	0.67	0.66	0.66	0.67	0.69	0.72	0.73
Stockton, Fort, Tex.	3010 B	3.14	3.13	3.08	3.03	2.91	2.92	2.94	2.94	2.96	3.03	3.12	3.14
Takosch Island, Wash.	86	0.10	0.10	0.10	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.10	0.10
Thomas, Camp, Ariz.	2710 B	2.83	2.83	2.78	2.73	2.67	2.63	2.59	2.62	2.64	2.71	2.84	2.82
Toledo, Ohio.	651	0.74	0.74	0.73	0.71	0.68	0.68	0.67	0.67	0.68	0.70	0.73	0.74
Unalaksha, Alaska.	19	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.02
Vicksburg, Miss.	244	0.27	0.27	0.26	0.26	0.25	0.25	0.24	0.24	0.25	0.26	0.27	0.27
Washington City.	106	0.12	0.12	0.12	0.12	0.11	0.11	0.11	0.11	0.11	0.12	0.12	0.12
West Las Animas, Colo.	3899	4.13	4.12	4.07	3.95	3.85	3.77	3.75	3.74	3.82	3.93	4.11	4.15
Wilmington, N. C.	52	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.06	0.06
Winnebago, Nev.	4358	4.55	4.54	4.51	4.41	4.34	4.26	4.19	4.22	4.30	4.43	4.53	4.57
Yankton, Dak.	1228	1.42	1.42	1.39	1.34	1.28	1.28	1.27	1.27	1.29	1.33	1.38	1.43
Yuma, Ariz.	141	0.15	0.15	0.15	0.15	0.15	0.14	0.14	0.14	0.14	0.14	0.15	0.15

## APPENDIX 6.

*Mean of the highest pressure (reduced to sea-level) at stations of the Signal Service, United States Army, for each month of the year. (Compiled from the commencement of observations at each station, to and including December, 1884.)*

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
<b>New England:</b>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
Eastport, Me. ....	30.61	30.66	30.52	30.38	30.41	30.31	30.22	30.29	30.44	30.49	30.58	30.62
Portland, Me. ....	30.66	30.67	30.54	30.39	30.41	30.32	30.23	30.30	30.44	30.50	30.58	30.64
Mount Washington, N. H. ....	30.40	30.36	30.32	30.32	30.41	30.43	30.38	30.44	30.47	30.45	30.44	30.41
Boston, Mass. ....	30.67	30.68	30.55	30.40	30.42	30.33	30.24	30.32	30.43	30.53	30.60	30.65
Block Island, R. I. ....	30.70	30.70	30.50	30.41	30.44	30.40	30.24	30.34	30.40	30.52	30.57	30.58
New Haven, Conn. ....	30.68	30.68	30.55	30.41	30.41	30.32	30.25	30.31	30.41	30.50	30.60	30.65
New London, Conn. ....	30.68	30.69	30.56	30.42	30.44	30.34	30.26	30.33	30.43	30.54	30.61	30.65
<b>Middle Atlantic States:</b>												
Albany, N. Y. ....	30.71	30.73	30.53	30.42	30.39	30.29	30.23	30.30	30.42	30.52	30.60	30.68
New York City. ....	30.69	30.70	30.55	30.42	30.41	30.32	30.25	30.31	30.40	30.54	30.62	30.65
Philadelphia, Pa. ....	30.70	30.70	30.55	30.42	30.41	30.32	30.25	30.30	30.40	30.54	30.62	30.65
Atlantic City, N. J. ....	30.68	30.69	30.53	30.42	30.39	30.30	30.23	30.28	30.37	30.52	30.59	30.61
Barnegat City, N. J. ....	30.68	30.68	30.53	30.42	30.39	30.30	30.23	30.27	30.37	30.51	30.59	30.60
Cape May, N. J. ....	30.67	30.66	30.54	30.39	30.38	30.29	30.24	30.27	30.37	30.51	30.58	30.62
Sandy Hook, N. J. ....	30.69	30.70	30.53	30.42	30.41	30.31	30.23	30.29	30.40	30.52	30.60	30.68
Delaware Break- water, Del. ....	30.77	30.74	30.54	30.39	30.39	30.32	30.23	30.33	30.37	30.52	30.62	30.60
Baltimore, Md. ....	30.70	30.71	30.56	30.42	30.41	30.32	30.25	30.29	30.39	30.54	30.63	30.65
Washington City ....	30.69	30.70	30.56	30.41	30.41	30.31	30.24	30.29	30.38	30.55	30.62	30.66
Cape Henry, Va. ....	30.68	30.65	30.52	30.40	30.36	30.28	30.24	30.26	30.34	30.49	30.56	30.59
Chincoteague, Va. ....	30.76	30.74	30.50	30.39	30.38	30.32	30.22	30.32	30.35	30.51	30.61	30.58
Lynchburg, Va. ....	30.68	30.66	30.54	30.39	30.37	30.29	30.24	30.26	30.37	30.53	30.60	30.68
Norfolk, Va. ....	30.66	30.65	30.55	30.40	30.37	30.30	30.23	30.28	30.35	30.50	30.57	30.61
<b>South Atlantic States:</b>												
Charlotte, N. C. ....	30.61	30.61	30.48	30.34	30.32	30.25	30.22	30.26	30.33	30.51	30.56	30.56
Hatteras, N. C. ....	30.69	30.64	30.46	30.37	30.34	30.26	30.23	30.24	30.30	30.46	30.52	30.52
Kitty Hawk, N. C. ....	30.65	30.68	30.54	30.40	30.36	30.29	30.26	30.26	30.34	30.48	30.53	30.57
Macon, Fort, N. C. ....	30.68	30.62	30.45	30.36	30.31	30.24	30.24	30.24	30.30	30.42	30.53	30.55
Smithville, N. C. ....	30.69	30.64	30.51	30.39	30.33	30.27	30.25	30.26	30.30	30.45	30.50	30.54
Wilmington, N. C. ....	30.61	30.58	30.42	30.33	30.32	30.27	30.25	30.25	30.30	30.46	30.51	30.56
Charleston, S. C. ....	30.60	30.52	30.40	30.37	30.30	30.24	30.25	30.23	30.26	30.42	30.48	30.53
Augusta, Ga. ....	30.62	30.57	30.52	30.37	30.31	30.27	30.26	30.26	30.31	30.46	30.54	30.58
Savannah, Ga. ....	30.58	30.51	30.50	30.36	30.29	30.24	30.25	30.23	30.26	30.40	30.48	30.53
Jacksonville, Fla. ....	30.52	30.48	30.44	30.33	30.28	30.21	30.23	30.21	30.20	30.36	30.40	30.46
<b>Florida Peninsula:</b>												
Cedar Keys, Fla. ....	30.51	30.44	30.37	30.31	30.24	30.19	30.21	30.20	30.21	30.30	30.38	30.41
Key West, Fla. ....	30.35	30.30	30.31	30.22	30.14	30.16	30.17	30.13	30.12	30.17	30.23	30.30
Sanford, Fla. ....	30.52	30.31	30.34	30.18	30.20	30.12	30.18	30.17	30.18	30.24	30.26	30.29
<b>Eastern Gulf States:</b>												
Atlanta, Ga. ....	30.57	30.51	30.46	30.36	30.29	30.23	30.23	30.24	30.30	30.44	30.52	30.54
Pensacola, Fla. ....	30.58	30.49	30.41	30.33	30.26	30.20	30.20	30.19	30.21	30.34	30.50	30.50
Mobile, Ala. ....	30.58	30.48	30.44	30.32	30.25	30.20	30.22	30.19	30.20	30.36	30.46	30.51
Montgomery, Ala. ....	30.61	30.52	30.47	30.33	30.26	30.22	30.23	30.21	30.24	30.39	30.49	30.58
Vicksburg, Miss. ....	30.68	30.56	30.47	30.34	30.28	30.20	30.22	30.20	30.26	30.43	30.56	30.60
New Orleans, La. ....	30.57	30.48	30.42	30.29	30.22	30.17	30.19	30.16	30.18	30.36	30.47	30.51
<b>Western Gulf States:</b>												
Shreveport, La. ....	30.65	30.54	30.46	30.32	30.23	30.18	30.19	30.17	30.24	30.40	30.54	30.60
Fort Smith, Ark. ....	30.75	30.63	30.54	30.30	30.22	30.18	30.21	30.21	30.25	30.41	30.60	30.71
Little Rock, Ark. ....	30.68	30.61	30.49	30.34	30.27	30.19	30.20	30.19	30.27	30.42	30.65	30.69
Galveston, Tex. ....	30.69	30.50	30.40	30.30	30.20	30.15	30.17	30.15	30.19	30.36	30.50	30.52
Indianola, Tex. ....	30.69	30.52	30.42	30.33	30.20	30.11	30.17	30.15	30.20	30.39	30.55	30.57
Palestine, Tex. ....	30.72	30.56	30.51	30.33	30.24	30.18	30.21	30.18	30.26	30.34	30.63	30.65
<b>Rio Grande Valley:</b>												
Brownsville, Tex. ....	30.50	30.42	30.32	30.27	30.15	30.08	30.09	30.06	30.11	30.25	30.46	30.54
Rio Grande City, Tex. ....	30.60	30.49	30.40	30.30	30.13	30.10	30.09	30.09	30.17	30.35	30.56	30.59
<b>Ohio Valley and Tennessee:</b>												
Chattanooga, Tenn. ....	30.62	30.57	30.48	30.38	30.30	30.26	30.24	30.24	30.30	30.46	30.60	30.58
Knoxville, Tenn. ....	30.65	30.58	30.50	30.35	30.30	30.24	30.24	30.25	30.30	30.47	30.55	30.58
Memphis, Tenn. ....	30.72	30.59	30.50	30.32	30.25	30.19	30.20	30.19	30.23	30.44	30.57	30.62
Nashville, Tenn. ....	30.68	30.58	30.50	30.33	30.28	30.21	30.20	30.21	30.27	30.44	30.57	30.60
Louisville, Ky. ....	30.69	30.61	30.48	30.29	30.23	30.20	30.20	30.20	30.30	30.44	30.55	30.59
Indianapolis, Ind. ....	30.64	30.62	30.48	30.30	30.31	30.20	30.20	30.21	30.32	30.45	30.56	30.59

*Mean of the highest pressure (reduced to sea-level) at stations of the Signal Service, &c.—Continued.*

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
<b>Ohio Valley and Tennessee—Continued.</b>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
Cincinnati, Ohio .....	30.68	30.64	30.50	30.34	30.33	30.22	30.21	30.22	30.33	30.47	30.58	30.61
Columbus, Ohio .....	30.66	30.62	30.48	30.36	30.34	30.26	30.19	30.22	30.37	30.50	30.61	30.62
Pittsburg, Pa. ....	30.64	30.64	30.51	30.36	30.34	30.26	30.21	30.24	30.36	30.48	30.57	30.58
<b>Lower Lakes:</b>												
Buffalo, N. Y. ....	30.64	30.67	30.51	30.39	30.35	30.26	30.20	30.26	30.38	30.48	30.56	30.61
Oswego, N. Y. ....	30.68	30.70	30.54	30.39	30.38	30.29	30.22	30.29	30.41	30.51	30.59	30.65
Rochester, N. Y. ....	30.67	30.69	30.53	30.40	30.36	30.26	30.21	30.26	30.39	30.50	30.60	30.62
Erie, Pa. ....	30.63	30.65	30.49	30.40	30.35	30.26	30.19	30.25	30.36	30.45	30.55	30.57
Cleveland, Ohio .....	30.62	30.65	30.51	30.39	30.36	30.27	30.21	30.25	30.36	30.46	30.56	30.60
Sandusky, Ohio .....	30.64	30.63	30.50	30.36	30.33	30.27	30.20	30.23	30.38	30.48	30.59	30.60
Toledo, Ohio .....	30.61	30.62	30.50	30.37	30.36	30.24	30.20	30.23	30.35	30.46	30.56	30.59
Detroit, Mich. ....	30.63	30.64	30.51	30.39	30.36	30.26	30.21	30.25	30.36	30.46	30.57	30.58
<b>Upper Lakes:</b>												
Alpena, Mich. ....	30.62	30.66	30.54	30.45	30.40	30.26	30.22	30.27	30.40	30.47	30.57	30.55
Escanaba, Mich. ....	30.63	30.65	30.50	30.43	30.41	30.27	30.23	30.25	30.41	30.49	30.59	30.57
Grand Haven, Mich. ....	30.59	30.62	30.51	30.37	30.37	30.25	30.21	30.25	30.37	30.48	30.54	30.57
Mackinaw City, Mich. ....	30.68	30.66	30.52	30.40	30.30	30.42	30.18	30.36	30.53	30.56	30.54	30.52
Marquette, Mich. ....	30.61	30.68	30.55	30.44	30.36	30.27	30.24	30.26	30.41	30.47	30.57	30.58
Port Huron, Mich. ....	30.62	30.66	30.48	30.39	30.39	30.24	30.21	30.24	30.37	30.46	30.56	30.56
Chicago, Ill. ....	30.62	30.63	30.52	30.34	30.36	30.23	30.21	30.23	30.33	30.47	30.56	30.59
Milwaukee, Wis. ....	30.64	30.65	30.54	30.38	30.39	30.26	30.24	30.26	30.38	30.49	30.56	30.61
Duluth, Minn. ....	30.69	30.73	30.61	30.44	30.36	30.24	30.22	30.24	30.36	30.50	30.67	30.63
<b>Upper Mississippi Valley:</b>												
Saint Paul, Minn. ....	30.67	30.70	30.56	30.36	30.31	30.16	30.18	30.21	30.35	30.46	30.63	30.62
La Crosse, Wis. ....	30.68	30.71	30.56	30.36	30.36	30.20	30.23	30.24	30.37	30.50	30.63	30.64
Davenport, Iowa .....	30.70	30.69	30.53	30.33	30.35	30.21	30.23	30.25	30.37	30.49	30.62	30.64
Des Moines, Iowa .....	30.72	30.63	30.58	30.39	30.34	30.20	30.23	30.23	30.36	30.52	30.64	30.70
Dubuque, Iowa .....	30.68	30.68	30.52	30.36	30.34	30.19	30.23	30.25	30.37	30.50	30.62	30.64
Keokuk, Iowa .....	30.69	30.64	30.51	30.29	30.30	30.16	30.18	30.20	30.32	30.46	30.59	30.64
Cairo, Ill. ....	30.76	30.64	30.53	30.33	30.29	30.22	30.22	30.23	30.31	30.47	30.60	30.65
Springfield, Ill. ....	30.71	30.66	30.51	30.33	30.34	30.22	30.24	30.26	30.36	30.49	30.65	30.68
Saint Louis, Mo. ....	30.74	30.65	30.63	30.32	30.30	30.20	30.22	30.23	30.33	30.49	30.61	30.66
<b>Missouri Valley:</b>												
Leavenworth, Kans. ....	30.76	30.61	30.55	30.36	30.25	30.17	30.19	30.20	30.34	30.48	30.64	30.68
Omaha, Nebr. ....	30.73	30.67	30.56	30.40	30.26	30.16	30.20	30.22	30.36	30.49	30.66	30.70
Bennett, Fort, Dak. ....	30.79	30.73	30.66	30.55	30.29	30.12	30.17	30.22	30.33	30.46	30.62	30.64
Huron, Dak. ....	30.82	30.73	30.67	30.54	30.22	30.15	30.18	30.28	30.34	30.50	30.66	30.79
Yankton, Dak. ....	30.82	30.74	30.67	30.49	30.31	30.20	30.23	30.27	30.42	30.56	30.75	30.77
<b>Extreme Northwest:</b>												
Moorhead, Minn. ....	30.79	30.76	30.62	30.53	30.32	30.18	30.20	30.27	30.33	30.51	30.66	30.75
Saint Vincent, Minn. ....	30.78	30.84	30.64	30.56	30.33	30.16	30.19	30.28	30.36	30.49	30.66	30.73
Bismarck, Dak. ....	30.67	30.65	30.57	30.45	30.27	30.20	30.17	30.26	30.34	30.52	30.60	30.67
Buford, Fort, Dak. ....	30.80	30.79	30.68	30.55	30.22	30.10	30.17	30.21	30.35	30.46	30.70	30.80
<b>Northern Slope:</b>												
Assinaboine, Fort, Mont. ....	30.69	30.75	30.59	30.56	30.30	30.17	30.16	30.18	30.44	30.47	30.64	30.78
Benton, Fort, Mont. ....	30.61	30.58	30.51	30.48	30.33	30.26	30.24	30.28	30.51	30.49	30.67	30.65
Custer, Fort, Mont. ....	30.72	30.67	30.53	30.52	30.24	30.08	30.11	30.20	30.39	30.47	30.67	30.82
Helena, Mont. ....	30.60	30.58	30.49	30.40	30.28	30.13	30.17	30.19	30.42	30.47	30.66	30.74
Magnums, Fort, Mont. ....	30.63	30.66	30.54	30.39	30.26	30.12	30.09	30.16	30.40	30.52	30.47	30.63
Shaw, Fort, Mont. ....	30.63	30.64	30.53	30.48	30.30	30.20	30.15	30.18	30.39	30.38	30.61	30.70
Deadwood, Dak. ....	30.56	30.55	30.54	30.46	30.14	30.04	30.08	30.15	30.33	30.42	30.62	30.73
Cheyenne, Wyo. ....	30.26	30.27	30.26	30.22	30.19	30.18	30.19	30.22	30.32	30.33	30.34	30.36
North Platte, Nebr. ....	30.49	30.42	30.35	30.23	30.03	30.02	29.96	30.04	30.18	30.33	30.53	30.54
<b>Middle Slope:</b>												
Denver, Colo. ....	30.36	30.33	30.33	30.30	30.25	30.15	30.21	30.25	30.35	30.36	30.44	30.43
Pike's Peak, Colo. ....	30.17	30.19	30.22	30.14	30.20	30.25	30.31	30.30	30.29	30.31	30.35	30.27
W. Las Animas, Colo. ....	30.54	30.52	30.51	30.38	30.17	30.04	30.04	30.06	30.23	30.37	30.59	30.67
Dodge City, Kans. ....	30.65	30.40	30.36	30.22	30.04	30.02	29.98	30.03	30.16	30.33	30.51	30.52
Elliott, Fort, Tex. ....	30.42	30.32	30.26	30.19	29.94	30.01	30.03	30.12	30.24	30.40	30.62	30.54
<b>Southern Slope:</b>												
Sill, Fort, Ind. T. ....	30.58	30.47	30.43	30.28	30.18	30.08	30.08	30.05	30.22	30.37	30.53	30.64
Concho, Fort, Tex. ....	30.50	30.43	30.33	30.21	30.00	30.01	30.00	30.00	30.13	30.39	30.50	30.61
Davis, Fort, Tex. ....	30.49	30.41	30.36	30.18	30.10	30.00	30.05	30.20	30.24	30.37	30.46	30.46
Stockton, Fort, Tex. ....	30.47	30.39	30.34	30.26	30.14	30.08	30.08	30.13	30.22	30.33	30.48	30.53
<b>Southern Plateau:</b>												
Santa Fé, N. Mex. ....	30.14	30.11	30.09	30.03	29.98	30.00	30.05	30.06	30.10	30.15	30.20	30.13
El Paso, Tex. ....	30.56	30.46	30.31	30.27	30.11	29.97	30.03	30.05	30.17	30.32	30.53	30.54
Apache, Fort, Ariz. ....	30.48	30.53	30.43	30.33	30.21	30.02	30.07	30.07	30.16	30.27	30.49	30.50
Grant, Fort, Ariz. ....	30.32	30.26	30.20	30.12	30.04	30.01	30.04	30.05	30.08	30.18	30.30	30.34
Prescott, Ariz. ....	30.39	30.38	30.33	30.23	30.16	30.09	30.12	30.11	30.19	30.27	30.40	30.43
Thomas, Camp, Ariz. ....	30.44	30.41	30.23	30.16	30.02	29.94	29.92	29.96	30.02	30.19	30.40	30.40
Yuma, Ariz. ....	30.43	30.38	30.21	30.15	30.04	29.94	29.93	29.95	29.99	30.14	30.31	30.40
<b>Middle Plateau:</b>												
Winnemucca, Nev. ....	30.47	30.47	30.40	30.24	30.25	30.12	30.11	30.28	30.23	30.38	30.52	30.56
Salt Lake City, Utah. ....	30.49	30.47	30.37	30.24	30.19	30.13	30.09	30.11	30.22	30.33	30.53	30.53

Mean of the highest pressure (reduced to sea-level) at stations of the Signal Service, &c.—  
Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
<b>Northern Plateau:</b>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
Boisé City, Idaho .....	30.66	30.61	30.54	30.35	30.37	30.24	30.14	30.19	30.34	30.45	30.68	30.70
Lewiston, Idaho .....	30.80	30.66	30.45	30.29	30.31	30.18	30.23	30.22	30.33	30.43	30.64	30.66
Dayton, Wash .....	30.75	30.61	30.48	30.29	30.32	30.20	30.23	30.24	30.31	30.40	30.56	30.66
Spokane Falls, Wash .....	30.71	30.61	30.47	30.30	30.33	30.17	30.18	30.23	30.32	30.41	30.54	30.67
<b>North Pacific Coast:</b>												
Olympia, Wash .....	30.57	30.54	30.47	30.35	30.37	30.27	30.27	30.22	30.34	30.46	30.51	30.50
Tatoosh Island, Wash .....	30.54	30.55	30.33	30.29	30.32	30.19	30.21	30.23	30.25	30.40	30.43	30.46
Portland, Oreg .....	30.59	30.56	30.47	30.45	30.40	30.34	30.29	30.27	30.32	30.46	30.49	30.53
Roseburg, Oreg .....	30.59	30.53	30.48	30.40	30.37	30.30	30.24	30.21	30.31	30.48	30.54	30.54
<b>Middle Pacific Coast:</b>												
Cape Mendocino, Cal .....	30.44	30.50	30.25	30.28	30.26	30.20	30.18	30.15	30.10	30.29	30.31	30.35
Red Bluff, Cal .....	30.51	30.47	30.37	30.29	30.19	30.14	30.05	30.07	30.11	30.28	30.43	30.46
Sacramento, Cal .....	30.49	30.46	30.34	30.28	30.19	30.13	30.06	30.08	30.11	30.25	30.41	30.45
San Francisco, Cal .....	30.44	30.44	30.34	30.32	30.20	30.17	30.11	30.13	30.13	30.25	30.37	30.39
<b>South Pacific Coast:</b>												
Los Angeles, Cal .....	30.37	30.35	30.26	30.21	30.14	30.08	30.05	30.05	30.06	30.15	30.26	30.34
San Diego, Cal .....	30.33	30.39	30.27	30.23	30.12	30.08	30.07	30.05	30.06	30.14	30.24	30.30
<b>Alaska Stations:</b>												
Saint Michael's, Fort, Alaska .....	30.56	30.71	30.38	30.42	30.36	30.26	30.22	30.20	30.16	30.40	30.42	30.59
Sitka, Alaska .....	30.49	30.74	30.34	30.48	30.44	30.27	30.36	30.23	30.34	30.37	30.38	30.44
Unalakhs, Alaska .....	30.50	30.71	30.48	30.38	30.41	30.39	30.40	30.34	30.25	30.47	30.48	30.50
Behring's Island, Behring Sea .....	30.13	30.54	30.21	30.30	30.38	30.28	30.09	30.30	30.40	30.29	30.39	30.21

## APPENDIX 7.

*Mean of the lowest pressure (reduced to sea-level) at stations of the Signal Service, United States Army, for each month of the year. (Compiled from the commencement of observations at each station, to and including December, 1884.)*

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
<b>New England:</b>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
Eastport, Me. ....	29.12	29.05	29.09	29.12	29.42	29.42	29.49	29.52	29.46	29.29	29.09	29.09
Portland, Me. ....	29.26	29.19	29.18	29.24	29.48	29.48	29.56	29.61	29.52	29.34	29.25	29.18
Mt. Washington, N. H.	29.17	29.14	29.18	29.24	29.49	29.67	29.75	29.82	29.65	29.46	29.24	29.15
Boston, Mass. ....	29.31	29.24	29.17	29.20	29.51	29.52	29.62	29.63	29.57	29.43	29.26	29.29
Block Island, R. I. ....	29.34	29.30	29.21	29.30	29.53	29.61	29.62	29.68	29.64	29.53	29.54	29.42
New Haven, Conn. ....	29.39	29.30	29.24	29.30	29.54	29.56	29.65	29.67	29.62	29.47	29.35	29.37
New London, Conn. ....	29.38	29.28	29.23	29.35	29.55	29.57	29.66	29.67	29.62	29.47	29.33	29.35
<b>Middle Atlantic States:</b>												
Albany, N. Y. ....	29.38	29.34	29.28	29.39	29.54	29.55	29.59	29.63	29.60	29.46	29.39	29.43
New York City. ....	29.40	29.33	29.30	29.43	29.57	29.59	29.65	29.70	29.65	29.50	29.39	29.40
Philadelphia, Pa. ....	29.43	29.37	29.30	29.45	29.57	29.62	29.67	29.69	29.65	29.51	29.43	29.42
Atlantic City, N. J. ....	29.40	29.36	29.30	29.42	29.58	29.62	29.66	29.68	29.64	29.51	29.51	29.39
Barnegat City, N. J. ....	29.38	29.34	29.28	29.41	29.57	29.60	29.63	29.66	29.63	29.49	29.45	29.39
Cape May, N. J. ....	29.45	29.38	29.31	29.46	29.58	29.63	29.70	29.68	29.64	29.51	29.42	29.39
Sandy Hook, N. J. ....	29.38	29.32	29.32	29.41	29.57	29.59	29.64	29.67	29.64	29.51	29.45	29.39
Del. Breakwater, Del.	29.30	29.27	29.35	29.47	29.59	29.64	29.68	29.70	29.67	29.59	29.63	29.54
Baltimore, Md. ....	29.47	29.43	29.34	29.48	29.59	29.64	29.70	29.71	29.63	29.51	29.47	29.43
Washington City. ....	29.48	29.45	29.37	29.49	29.58	29.64	29.70	29.71	29.63	29.59	29.47	29.43
Cape Henry, Va. ....	29.46	29.45	29.38	29.45	29.61	29.65	29.70	29.66	29.69	29.67	29.54	29.58
Chincoteague, Va. ....	29.35	29.44	29.37	29.47	29.60	29.66	29.67	29.72	29.67	29.63	29.68	29.57
Lynchburg, Va. ....	29.52	29.50	29.39	29.49	29.61	29.64	29.71	29.71	29.68	29.59	29.52	29.48
Norfolk, Va. ....	29.49	29.46	29.40	29.49	29.62	29.67	29.72	29.71	29.65	29.56	29.50	29.43
<b>South Atlantic States:</b>												
Charlotte, N. C. ....	29.54	29.63	29.51	29.52	29.66	29.66	29.72	29.75	29.76	29.76	29.70	29.63
Hatteras, N. C. ....	29.40	29.54	29.48	29.38	29.58	29.71	29.72	29.78	29.74	29.70	29.64	29.64
Kitty Hawk, N. C. ....	29.46	29.43	29.40	29.46	29.65	29.69	29.74	29.71	29.70	29.61	29.59	29.47
Macon, Fort, N. C. ....	29.48	29.56	29.52	29.42	29.60	29.73	29.72	29.78	29.74	29.73	29.68	29.78
Smithville, N. C. ....	29.58	29.62	29.47	29.58	29.71	29.76	29.77	29.78	29.78	29.67	29.63	29.71
Wilmington, N. C. ....	29.59	29.58	29.48	29.54	29.67	29.72	29.78	29.78	29.78	29.66	29.62	29.62
Charleston, S. C. ....	29.67	29.68	29.57	29.58	29.71	29.77	29.81	29.78	29.80	29.66	29.70	29.63
Augusta, Ga. ....	29.65	29.66	29.60	29.60	29.71	29.75	29.79	29.80	29.79	29.72	29.72	29.67
Savannah, Ga. ....	29.68	29.70	29.62	29.62	29.72	29.78	29.82	29.77	29.68	29.70	29.72	29.66
Jacksonville, Fla. ....	29.73	29.75	29.68	29.67	29.74	29.81	29.84	29.82	29.68	29.72	29.75	29.72
<b>Florida Peninsula:</b>												
Cedar Keys, Fla. ....	29.73	29.88	29.82	29.77	29.79	29.83	29.91	29.75	29.79	29.83	29.83	29.86
Key West, Fla. ....	29.90	29.91	29.88	29.81	29.83	29.91	29.93	29.86	29.77	29.65	29.82	29.86
Sanford, Fla. ....	29.76	29.73	29.84	29.62	29.79	29.79	29.88	29.82	29.82	29.84	29.84	29.92
<b>Eastern Gulf States:</b>												
Atlanta, Ga. ....	29.64	29.66	29.62	29.66	29.71	29.73	29.80	29.79	29.72	29.81	29.70	29.70
Pensacola, Fla. ....	29.80	29.74	29.78	29.74	29.77	29.81	29.87	29.72	29.71	29.83	29.84	29.80
Mobile, Ala. ....	29.79	29.69	29.70	29.67	29.76	29.82	29.87	29.79	29.71	29.78	29.76	29.70
Montgomery, Ala. ....	29.74	29.66	29.68	29.64	29.74	29.79	29.84	29.80	29.73	29.79	29.75	29.70
Vicksburg, Miss. ....	29.77	29.65	29.66	29.59	29.73	29.80	29.89	29.80	29.77	29.84	29.76	29.74
New Orleans, La. ....	29.80	29.69	29.70	29.64	29.75	29.81	29.87	29.80	29.69	29.81	29.77	29.72
<b>Western Gulf States:</b>												
Shreveport, La. ....	29.73	29.58	29.61	29.54	29.67	29.76	29.84	29.75	29.78	29.75	29.67	29.70
Fort Smith, Ark. ....	29.75	29.59	29.60	29.43	29.65	29.66	29.73	29.83	29.77	29.71	29.70	29.58
Little Rock, Ark. ....	29.71	29.58	29.59	29.48	29.69	29.73	29.82	29.78	29.78	29.74	29.78	29.61
Galveston, Tex. ....	29.80	29.67	29.67	29.59	29.72	29.81	29.88	29.78	29.71	29.81	29.74	29.77
Indianola, Tex. ....	29.78	29.66	29.66	29.58	29.70	29.79	29.87	29.82	29.79	29.82	29.75	29.76
Palestine, Tex. ....	29.86	29.69	29.67	29.55	29.70	29.76	29.87	29.86	29.83	29.80	29.80	29.68
<b>Rio Grande Valley:</b>												
Brownsville, Tex. ....	29.78	29.64	29.65	29.54	29.67	29.71	29.83	29.78	29.78	29.76	29.74	29.73
Rio Grande City, Tex.	29.79	29.59	29.64	29.54	29.60	29.75	29.78	29.68	29.77	29.78	29.73	29.74
<b>Ohio Valley and Tennessee:</b>												
Chattanooga, Tenn. ....	29.69	29.63	29.59	29.62	29.71	29.73	29.79	29.80	29.74	29.81	29.80	29.77
Knoxville, Tenn. ....	29.64	29.57	29.52	29.56	29.58	29.71	29.76	29.80	29.74	29.77	29.66	29.61
Memphis, Tenn. ....	29.69	29.55	29.56	29.52	29.67	29.72	29.82	29.77	29.78	29.76	29.65	29.65
Nashville, Tenn. ....	29.64	29.52	29.51	29.52	29.64	29.70	29.78	29.77	29.74	29.77	29.67	29.64
Louisville, Ky. ....	29.54	29.48	29.42	29.48	29.62	29.60	29.73	29.73	29.71	29.68	29.57	29.57
Indianapolis, Ind. ....	29.52	29.45	29.38	29.43	29.53	29.55	29.68	29.71	29.68	29.62	29.50	29.52
Cincinnati, Ohio. ....	29.54	29.48	29.38	29.48	29.59	29.59	29.70	29.72	29.72	29.66	29.54	29.55
Columbus, Ohio. ....	29.54	29.50	29.40	29.46	29.58	29.58	29.64	29.71	29.69	29.67	29.67	29.65
Pittsburg, Pa. ....	29.47	29.43	29.33	29.42	29.52	29.59	29.66	29.68	29.68	29.56	29.44	29.47

Mean of the lowest pressure (reduced to sea-level) at stations of the Signal Service, &c.—  
Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
<b>Lower Lakes:</b>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
Buffalo, N. Y. ....	29.42	29.39	29.28	29.37	29.50	29.54	29.56	29.61	29.57	29.45	29.48	29.40
Oswego, N. Y. ....	29.42	29.41	29.24	29.41	29.53	29.57	29.58	29.62	29.58	29.45	29.36	29.37
Rochester, N. Y. ....	29.42	29.40	29.26	29.40	29.51	29.55	29.56	29.60	29.59	29.46	29.35	29.37
Eric, Pa. ....	29.45	29.40	29.29	29.38	29.52	29.55	29.60	29.64	29.60	29.47	29.39	29.48
Cleveland, Ohio. ....	29.49	29.42	29.35	29.41	29.52	29.54	29.65	29.67	29.66	29.53	29.42	29.48
Sandusky, Ohio. ....	29.53	29.43	29.36	29.39	29.57	29.52	29.62	29.69	29.65	29.62	29.49	29.49
Toledo, Ohio. ....	29.48	29.41	29.28	29.38	29.50	29.50	29.62	29.68	29.63	29.54	29.42	29.47
Detroit, Mich. ....	29.48	29.38	29.27	29.35	29.48	29.49	29.60	29.63	29.61	29.49	29.38	29.43
<b>Upper Lakes:</b>												
Alpena, Mich. ....	29.38	29.31	29.26	29.30	29.45	29.45	29.56	29.57	29.47	29.34	29.37	29.31
Escanaba, Mich. ....	29.39	29.33	29.29	29.32	29.46	29.41	29.55	29.60	29.47	29.32	29.38	29.30
Grand Haven, Mich. ....	29.45	29.38	29.25	29.31	29.50	29.49	29.62	29.68	29.59	29.46	29.38	29.40
Mackinaw City, Mich. ....	29.32	29.46	29.32	29.30	29.50	29.60	29.48	29.56	29.41	29.50	29.48	29.41
Marquette, Mich. ....	29.41	29.34	29.29	29.31	29.45	29.40	29.46	29.57	29.49	29.29	29.39	29.32
Port Huron, Mich. ....	29.44	29.37	29.26	29.34	29.48	29.50	29.57	29.61	29.56	29.49	29.36	29.42
Chicago, Ill. ....	29.48	29.41	29.28	29.33	29.49	29.49	29.62	29.69	29.58	29.49	29.45	29.44
Milwaukee, Wis. ....	29.43	29.37	29.26	29.31	29.49	29.47	29.62	29.65	29.58	29.45	29.40	29.39
Duluth, Minn. ....	29.40	29.41	29.35	29.34	29.44	29.42	29.53	29.58	29.50	29.32	29.46	29.40
<b>Upper Mississippi Valley:</b>												
Saint Paul, Minn. ....	29.42	29.41	29.33	29.34	29.38	29.37	29.58	29.55	29.50	29.32	29.45	29.41
La Crosse, Wis. ....	29.48	29.49	29.30	29.32	29.45	29.46	29.60	29.62	29.55	29.47	29.46	29.41
Davenport, Iowa. ....	29.52	29.40	29.39	29.36	29.49	29.52	29.65	29.71	29.67	29.49	29.45	29.46
Des Moines, Iowa. ....	29.51	29.44	29.36	29.36	29.48	29.44	29.66	29.70	29.60	29.48	29.56	29.50
Dubuque, Iowa. ....	29.52	29.45	29.29	29.35	29.49	29.49	29.65	29.68	29.62	29.45	29.44	29.44
Keokuk, Iowa. ....	29.50	29.39	29.31	29.36	29.47	29.51	29.63	29.70	29.63	29.48	29.46	29.47
Cairo, Ill. ....	29.65	29.51	29.49	29.48	29.65	29.67	29.78	29.78	29.77	29.71	29.66	29.61
Springfield, Ill. ....	29.59	29.46	29.35	29.46	29.57	29.57	29.72	29.76	29.71	29.61	29.63	29.48
Saint Louis, Mo. ....	29.59	29.40	29.41	29.42	29.53	29.61	29.71	29.76	29.72	29.62	29.55	29.55
<b>Missouri Valley:</b>												
Leavenworth, Kans. ....	29.53	29.40	29.37	29.34	29.40	29.50	29.64	29.68	29.61	29.46	29.50	29.50
Omaha, Nebr. ....	29.46	29.39	29.32	29.29	29.33	29.42	29.56	29.63	29.54	29.45	29.50	29.51
Bennett, Fort, Dak. ....	29.58	29.51	29.44	29.45	29.32	29.50	29.58	29.50	29.54	29.53	29.59	29.61
Huron, Dak. ....	29.59	29.51	29.40	29.48	29.32	29.52	29.54	29.51	29.55	29.48	29.61	29.59
Yankton, Dak. ....	29.48	29.45	29.35	29.35	29.32	29.43	29.53	29.57	29.50	29.40	29.50	29.55
<b>Extreme Northwest:</b>												
Moorhead, Minn. ....	29.50	29.54	29.48	29.54	29.43	29.52	29.56	29.50	29.52	29.38	29.58	29.56
Saint Vincent, Minn. ....	29.42	29.45	29.37	29.51	29.48	29.53	29.45	29.43	29.44	29.36	29.49	29.51
Bismarck, Dak. ....	29.38	29.45	29.31	29.40	29.32	29.42	29.45	29.47	29.44	29.38	29.44	29.47
Buford, Fort, Dak. ....	29.40	29.43	29.42	29.39	29.39	29.45	29.49	29.45	29.44	29.41	29.44	29.52
<b>Northern Slope:</b>												
Assinaboine, Fort, Mont. ....	29.67	29.64	29.60	29.50	29.63	29.65	29.60	29.58	29.64	29.60	29.70	29.58
Benton, Fort, Mont. ....	29.49	29.57	29.49	29.48	29.59	29.62	29.64	29.72	29.65	29.60	29.63	29.55
Custer, Fort, Mont. ....	29.76	29.52	29.58	29.51	29.58	29.55	29.51	29.64	29.63	29.59	29.60	29.72
Helena, Mont. ....	29.78	29.59	29.65	29.51	29.62	29.61	29.65	29.68	29.72	29.67	29.89	29.70
Maginnis, Fort, Mont. ....	29.83	29.80	29.61	29.50	29.60	29.66	29.65	29.68	29.74	29.56	29.79	29.63
Shaw, Fort, Mont. ....	29.71	29.62	29.68	29.48	29.62	29.62	29.61	29.64	29.64	29.58	29.78	29.60
Deadwood, Dak. ....	29.71	29.66	29.58	29.51	29.41	29.51	29.57	29.64	29.65	29.63	29.67	29.73
Cheyenne, Wyo. ....	29.51	29.55	29.50	29.45	29.52	29.65	29.78	29.79	29.73	29.59	29.66	29.58
North Platte, Nebr. ....	29.23	29.26	29.06	29.99	29.99	29.20	29.26	29.29	29.27	29.18	29.31	29.32
<b>Middle Slope:</b>												
Denver, Colo. ....	29.53	29.54	29.49	29.44	29.50	29.62	29.75	29.78	29.69	29.62	29.68	29.60
Pike's Peak, Colo. ....	29.48	29.49	29.46	29.43	29.55	29.76	30.00	29.95	29.82	29.63	29.61	29.49
West Las Animas, Colo. ....	29.68	29.50	29.57	29.26	29.32	29.50	29.56	29.54	29.57	29.54	29.72	29.64
Dodge City, Kans. ....	29.82	29.22	29.10	29.06	29.04	29.28	29.38	29.40	29.34	29.29	29.33	29.30
Elliot, Fort, Tex. ....	29.89	29.31	29.33	29.17	29.22	29.49	29.60	29.72	29.67	29.67	29.72	29.52
<b>Southern Slope:</b>												
Sill, Fort, Ind. T. ....	29.54	29.43	29.38	29.26	29.40	29.49	29.66	29.62	29.61	29.54	29.54	29.46
Concho, Fort, Tex. ....	29.47	29.40	29.42	29.28	29.40	29.50	29.56	29.61	29.57	29.56	29.50	29.57
Davis, Fort, Tex. ....	29.88	29.84	29.80	29.75	29.79	29.81	29.98	29.92	29.85	29.84	29.90	29.90
Stockton, Fort, Tex. ....	29.71	29.66	29.59	29.49	29.66	29.67	29.79	29.80	29.76	29.74	29.78	29.78
<b>Southern Plateau:</b>												
Santa Fé, N. Mex. ....	29.38	29.48	29.46	29.40	29.47	29.61	29.73	29.74	29.71	29.59	29.58	29.42
El Paso, Tex. ....	29.69	29.81	29.78	29.62	29.59	29.62	29.71	29.74	29.68	29.75	29.84	29.88
Apache, Fort, Ariz. ....	29.94	29.94	29.89	29.86	29.85	29.72	29.83	29.83	29.79	29.75	29.79	29.90
Giant, Fort, Ariz. ....	29.79	29.77	29.77	29.71	29.74	29.75	29.83	29.78	29.77	29.77	29.79	29.80
Prescott, Ariz. ....	29.78	29.73	29.77	29.72	29.77	29.76	29.84	29.82	29.80	29.79	29.82	29.82
Thomas, Camp, Ariz. ....	29.81	29.76	29.76	29.65	29.64	29.61	29.64	29.68	29.61	29.62	29.68	29.65
Yuma, Ariz. ....	29.77	29.70	29.71	29.66	29.61	29.56	29.59	29.58	29.62	29.64	29.64	29.75
<b>Middle Plateau:</b>												
Winnemucca, Nev. ....	29.64	29.65	29.58	29.56	29.65	29.69	29.71	29.71	29.76	29.67	29.76	29.71
Salt Lake City, Utah. ....	29.60	29.59	29.54	29.50	29.58	29.59	29.65	29.68	29.64	29.61	29.69	29.64
<b>Northern Plateau:</b>												
Boise City, Idaho. ....	29.64	29.64	29.60	29.56	29.68	29.68	29.59	29.62	29.66	29.61	29.72	29.70
Lewiston, Idaho. ....	29.56	29.45	29.40	29.50	29.58	29.58	29.65	29.65	29.60	29.51	29.66	29.40

*Mean of the lowest pressure (reduced to sea-level) at stations of the Signal Service, &c.—*  
Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Northern Plateau—Continued:	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
Dayton, Wash .....	29.57	29.46	29.44	29.54	29.60	29.71	29.78	29.77	29.78	29.56	29.72	29.48
Spokane Falls, Wash .....	29.63	29.42	29.43	29.46	29.59	29.66	29.70	29.72	29.70	29.54	29.68	29.47
North Pacific Coast:												
Olympia, Wash .....	29.35	29.34	29.33	29.50	29.66	29.72	29.75	29.74	29.57	29.40	29.44	29.34
Tatoosh Island, Wash .....	29.44	29.21	29.40	29.46	29.74	29.74	29.86	29.77	29.30	29.48	29.56	29.12
Portland, Oreg .....	29.35	29.53	29.47	29.60	29.71	29.76	29.80	29.80	29.71	29.50	29.52	29.51
Roseburg, Oreg .....	29.49	29.51	29.47	29.55	29.71	29.77	29.79	29.78	29.70	29.57	29.61	29.55
Middle Pacific Coast:												
Cape Mendocino, Cal .....	29.59	29.40	29.24	29.48	29.74	29.74	29.81	29.82	29.68	29.61	29.81	29.50
Red Bluff, Cal .....	29.66	29.63	29.58	29.64	29.73	29.64	29.63	29.64	29.69	29.68	29.77	29.60
Sacramento, Cal .....	29.73	29.65	29.66	29.68	29.75	29.70	29.70	29.69	29.71	29.73	29.79	29.66
San Francisco, Cal .....	29.65	29.68	29.73	29.75	29.81	29.78	29.78	29.78	29.76	29.77	29.79	29.60
South Pacific Coast:												
Los Angeles, Cal .....	29.79	29.76	29.84	29.82	29.82	29.81	29.80	29.78	29.77	29.78	29.76	29.76
San Diego, Cal .....	29.81	29.79	29.84	29.85	29.83	29.82	29.82	29.80	29.77	29.82	29.83	29.80
Alaska Stations:												
Saint Michael's, Fort,												
Alaska .....	28.82	29.22	29.30	29.15	29.17	29.42	29.42	29.33	29.15	29.07	28.92	29.05
Sitka, Alaska .....	29.13	29.02	29.25	29.18	29.32	29.45	29.62	29.55	29.28	29.04	28.92	28.74
Unalaska, Alaska .....	28.39	29.09	29.10	29.00	29.05	29.20	29.40	29.12	28.90	28.70	28.52	28.61
Behring's Island,												
Behring Sea .....	28.78	29.00	29.03	29.18	29.18	29.45	29.46	29.30	29.02	28.80	28.48	28.70



## APPENDIX 8.

*Mean temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army, for each month and the year. (Computed from the commencement of observations at each, to and including July, 1872.)*

[The daily means are obtained by dividing the sum of the 7.35 a. m., 4.35 and 11.35 p. m. (Washington time) observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
<b>New England:</b>	o	o	o	o	o	o	o	o	o	o	o	o	o
Mount Washington, N. H. . . . .	28.6	5.6	-0.7	21.0	33.3	42.5	47.2	47.0	36.6	29.8	11.8	3.8	.....
Boston, Mass. . . . .	26.7	28.4	34.2	45.8	58.1	67.0	72.8	71.7	59.3	54.0	39.6	30.1	48.9
New London, Conn. . . . .	27.0	27.2	33.4	46.2	56.6	65.6	72.2	70.9	58.4	54.1	36.4	27.9	.....
<b>Middle Atlantic States:</b>													
New York City . . . . .	29.9	31.0	36.2	50.4	61.0	69.8	74.0	73.0	60.8	54.9	43.8	32.1	51.6
Philadelphia, Pa. . . . .	32.2	34.1	40.2	54.2	64.6	71.4	76.8	76.9	62.6	56.5	40.0	30.2	54.5
Cape May, N. J. . . . .	30.9	30.2	33.8	47.9	58.4	68.0	73.2	73.0	63.4	58.3	42.4	32.8	.....
Baltimore, Md. . . . .	34.6	37.8	42.2	57.0	66.3	74.6	78.6	77.2	63.4	58.2	44.7	33.5	56.1
Washington City . . . . .	32.2	34.8	41.7	57.1	65.6	74.3	77.0	76.8	62.3	58.1	44.4	33.0	54.8
Lynchburg, Va. . . . .	33.8	34.8	39.0	57.2	66.9	78.2	75.8	73.9	62.1	57.1	43.5	35.4	.....
Norfolk, Va. . . . .	41.0	41.6	48.1	61.1	70.0	75.6	79.0	79.3	67.5	62.4	48.9	41.0	60.6
<b>South Atlantic States:</b>													
Wilmington, N. C. . . . .	44.7	48.7	54.2	64.4	72.6	79.4	82.8	80.2	70.1	64.7	55.0	45.6	64.3
Charleston, S. C. . . . .	41.7	51.4	57.3	66.1	73.8	80.2	83.5	79.6	72.6	68.5	58.1	48.0	65.5
Savannah, Ga. . . . .	48.0	53.2	57.8	67.5	74.0	79.0	82.0	79.3	71.6	68.0	58.5	49.8	66.6
<b>Florida Peninsula:</b>													
Key West, Fla. . . . .	68.2	71.0	73.7	77.6	79.4	82.8	82.8	84.2	82.4	80.3	74.7	69.2	77.2
<b>Eastern Gulf States:</b>													
Mobile, Ala. . . . .	47.6	55.0	58.1	68.4	74.4	80.7	81.5	83.0	74.9	68.7	57.9	51.9	67.5
New Orleans, La. . . . .	50.8	57.9	61.8	69.3	74.4	81.2	82.8	83.8	75.8	70.7	60.1	51.6	69.2
<b>Western Gulf States:</b>													
Galveston, Tex. . . . .	49.7	55.3	60.8	71.8	77.2	82.8	86.0	85.1	78.8	71.7	60.3	56.0	.....
<b>Ohio Valley and Tennessee:</b>													
Knoxville, Tenn. . . . .	35.1	41.8	40.7	59.8	66.3	73.8	78.8	78.3	66.3	57.6	45.9	36.6	58.0
Memphis, Tenn. . . . .	45.4	42.3	51.2	63.4	71.0	79.8	79.8	82.3	68.2	61.9	48.5	39.1	.....
Nashville, Tenn. . . . .	38.0	40.7	49.9	63.4	70.2	77.7	79.6	80.4	68.7	61.0	46.4	42.4	.....
Indianapolis, Ind. . . . .	26.6	29.6	41.1	56.3	65.2	73.7	76.0	75.8	62.3	57.1	38.6	27.5	.....
Cincinnati, Ohio . . . . .	33.6	38.4	44.2	58.2	65.8	74.7	78.2	79.4	64.7	58.5	43.3	33.2	.....
Pittsburg, Pa. . . . .	27.8	30.5	39.0	54.4	63.5	72.0	73.4	73.3	59.5	54.8	38.2	30.2	.....
<b>Lower Lakes:</b>													
Buffalo, N. Y. . . . .	26.6	27.4	34.0	46.9	55.4	66.2	71.1	70.7	58.2	52.3	34.7	28.8	48.3
Oswego, N. Y. . . . .	25.0	24.6	31.4	45.0	54.0	64.4	70.1	70.2	57.7	53.5	35.8	28.2	47.1
Rochester, N. Y. . . . .	23.5	24.0	30.6	45.8	56.4	65.8	70.2	70.0	56.2	53.1	35.8	26.8	47.1
Cleveland, Ohio . . . . .	27.4	27.9	35.4	50.2	58.8	68.8	72.4	71.2	60.1	54.8	39.4	27.6	50.0
Toledo, Ohio . . . . .	26.3	26.2	35.1	50.4	60.4	69.8	73.7	71.5	59.8	54.5	34.4	23.5	49.5
Detroit, Mich. . . . .	24.5	25.6	32.4	45.8	57.1	66.8	71.0	69.8	58.2	53.7	33.3	24.9	47.2
<b>Upper Lakes:</b>													
Escanaba, Mich. . . . .	15.9	16.3	15.6	36.1	46.5	62.0	65.6	65.0	53.7	46.8	31.6	18.2	.....
Grand Haven, Mich. . . . .	24.2	21.0	23.4	46.4	52.2	65.0	69.3	68.6	56.4	51.2	32.8	22.8	.....
Marquette, Mich. . . . .	18.6	17.2	15.7	38.1	46.9	61.2	64.0	65.6	55.3	46.0	29.9	13.7	.....
Chicago, Ill. . . . .	27.0	27.8	34.4	50.0	56.5	62.2	72.4	72.7	61.0	( <sup>1</sup> )	35.0	20.0	.....
Milwaukee, Wis. . . . .	22.8	24.0	29.3	44.0	53.6	65.6	68.8	69.7	58.1	48.3	36.8	20.8	45.2
Duluth, Minn. . . . .	13.2	17.1	22.0	37.7	49.4	60.8	66.2	62.5	56.0	44.7	31.0	14.8	39.4
<b>Upper Mississippi Valley:</b>													
Saint Paul, Minn. . . . .	15.2	20.1	31.1	45.6	58.6	67.4	70.6	68.2	58.2	46.7	33.6	15.9	43.6
Keokuk, Iowa . . . . .	24.9	31.0	34.4	54.0	64.4	75.2	78.4	75.6	63.8	57.0	35.4	25.2	.....
Cairo, Ill. . . . .	31.2	37.0	42.5	62.0	68.3	75.5	79.8	79.5	67.2	60.4	43.4	34.3	.....
Saint Louis, Mo. . . . .	33.0	36.0	44.4	58.9	68.1	78.0	79.5	78.1	66.0	59.0	39.8	30.2	57.5
<b>Missouri Valley:</b>													
Leavenworth, Kans. . . . .	24.7	30.9	36.3	56.6	64.5	76.9	77.9	72.8	70.7	56.2	36.4	24.1	.....
Omaha, Nebr. . . . .	21.6	28.9	36.0	52.2	62.2	74.1	75.8	73.5	62.2	53.2	30.7	18.8	50.1
<b>Northern Slope:</b>													
Cheyenne, Wyo. . . . .	27.4	30.5	33.2	39.3	52.6	63.3	65.8	65.4	57.4	44.8	33.8	24.1	45.6
<b>Middle Pacific Coast:</b>													
San Francisco, Cal. . . . .	52.2	54.2	52.8	58.4	55.1	58.0	57.2	57.9	60.4	61.8	54.9	52.9	.....

<sup>1</sup> No record.

## APPENDIX 9.

*Mean temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army, for each month and the year. (Computed from September, 1872, to and including October, 1879, except at stations opened subsequent to the former date.)*

[The daily means are obtained by dividing the sum of the 7.35 a. m., 4.35 and 11.00 p. m. (Washington time) observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
<b>New England:</b>	°	°	°	°	°	°	°	°	°	°	°	°	°
Eastport, Me.....	19.3	22.1	23.0	37.9	47.5	54.6	60.3	60.5	55.2	47.3	34.2	24.4	41.2
Portland, Me.....	32.4	25.0	33.2	42.7	54.8	63.7	69.6	67.6	60.0	50.1	36.2	29.0	46.4
Mount Washington, N. H.....	4.9	5.5	12.8	20.8	33.0	44.0	48.3	44.9	40.0	30.3	16.4	8.1	26.1
Burlington, Vt.....	18.6	20.1	29.2	41.8	55.5	66.2	71.1	68.6	60.2	48.9	34.5	22.7	45.0
Boston, Mass.....	25.9	27.1	34.5	43.2	54.5	66.2	72.0	69.2	62.1	52.0	38.7	23.8	48.2
Wood's Holl, Mass.....	30.2	30.5	35.6	42.9	52.9	62.5	68.8	68.6	62.7	54.9	42.7	34.3	43.9
New Haven, Conn.....	28.2	29.4	36.1	45.9	58.7	68.4	73.8	71.1	64.0	54.0	40.6	30.5	50.2
New London, Conn.....	28.4	29.1	33.7	44.7	56.3	65.7	71.6	69.9	63.1	53.3	40.5	31.1	49.3
<b>Middle Atlantic States:</b>													
Albany, N. Y.....	21.7	22.4	31.3	43.1	57.6	67.4	71.6	70.0	61.3	49.8	37.2	26.2	46.7
New York City.....	29.8	30.4	37.2	46.0	58.4	68.6	74.0	72.1	65.1	55.3	41.9	32.4	51.0
Philadelphia, Pa.....	31.1	32.1	39.2	48.4	61.0	71.2	76.4	73.1	65.6	55.4	42.6	33.5	52.5
Atlantic City, N. J.....	31.4	32.7	38.4	46.0	56.9	66.8	72.0	72.2	66.1	56.0	44.0	34.6	51.5
Barnegat City, N. J.....	30.6	31.5	37.8	45.4	57.0	66.7	72.0	72.0	65.0	54.0	43.5	33.6	51.1
Cape May, N. J.....	33.9	34.2	40.2	47.6	57.9	68.3	73.2	73.1	67.4	58.0	45.5	36.7	53.1
Sandy Hook, N. J.....	30.5	30.8	37.3	45.3	58.1	68.5	73.2	72.8	65.8	54.2	44.3	34.0	51.5
Baltimore, Md.....	34.3	35.9	43.2	51.9	63.6	74.0	79.2	74.9	67.4	56.5	44.6	36.4	55.2
Washington City.....	33.6	35.2	42.7	51.9	63.6	73.8	79.1	74.1	67.1	57.3	43.7	35.5	54.8
Cape Henry, Va.....	40.8	41.6	47.5	53.9	65.4	73.4	78.4	76.3	71.0	61.9	51.2	42.8	58.6
Lynchburg, Va.....	36.8	39.7	46.8	55.6	65.5	74.7	80.2	75.3	68.3	57.1	45.3	37.7	57.0
Norfolk, Va.....	40.6	41.6	48.3	55.2	65.2	75.8	80.1	76.6	70.2	59.6	48.8	40.8	58.7
<b>South Atlantic States:</b>													
Cape Hatteras, N. C.....	45.3	45.6	51.6	56.6	64.7	73.7	79.8	77.7	72.7	64.3	55.7	47.1	61.4
Charlotte, N. C.....	41.0	40.7	54.6	58.6	68.4	74.9	79.0	78.6	68.0	65.0	49.4	38.1	58.6
Kitty Hawk, N. C.....	42.0	41.8	48.9	54.6	63.1	72.8	78.9	77.2	71.5	62.3	52.4	43.1	59.6
Smithville, N. C.....	46.5	47.9	55.0	61.2	68.7	76.6	81.4	80.0	74.2	63.5	55.8	46.5	63.3
Wilmington, N. C.....	46.4	47.8	54.6	61.0	68.5	75.7	80.3	78.0	73.1	62.5	53.2	46.0	62.4
Charleston, S. C.....	48.9	51.3	57.7	64.0	72.8	79.3	82.7	80.8	76.1	65.6	56.7	49.6	65.5
Augusta, Ga.....	47.4	49.3	56.4	63.3	72.6	78.8	82.3	79.7	74.4	62.8	52.9	45.8	63.0
Savannah, Ga.....	51.6	53.0	59.6	66.1	73.9	80.0	82.8	80.8	75.8	65.4	57.1	50.7	66.4
Jacksonville, Fla.....	55.6	57.0	62.7	68.7	75.4	80.4	82.8	81.9	77.8	68.6	60.8	54.3	68.9
<b>Florida Peninsula:</b>													
Key West, Fla.....	69.6	71.3	73.5	76.5	80.1	83.0	83.6	84.3	83.0	77.5	74.1	69.5	77.3
Punta Rasa, Fla.....	64.1	65.8	68.6	72.2	76.7	80.3	81.3	82.2	80.1	74.8	69.0	63.6	73.3
<b>Eastern Gulf States:</b>													
Atlanta, Ga.....	44.1	43.7	57.0	59.5	70.2	75.3	79.8	73.4	69.1	61.6	52.9	40.6	.....
Mobile, Ala.....	50.3	53.6	59.9	65.9	74.5	80.7	83.0	80.5	76.7	66.3	57.4	51.1	66.8
Montgomery, Ala.....	48.4	51.6	57.7	64.0	73.6	79.5	83.1	80.5	75.2	63.9	54.3	48.0	65.2
Vicksburg, Miss.....	47.6	52.0	59.4	64.4	73.3	79.6	82.3	80.0	75.1	64.8	54.7	49.1	65.3
New Orleans, La.....	53.9	57.3	63.0	67.6	74.9	80.8	82.7	81.9	77.8	69.2	60.7	54.6	68.7
<b>Western Gulf States:</b>													
Shreveport, La.....	46.1	51.4	59.7	64.8	73.7	80.4	83.2	82.0	74.9	65.4	54.6	48.8	65.5
Fort Gibson, Ind. T.....	36.4	42.7	51.0	58.7	69.0	76.1	81.4	79.7	71.5	59.5	47.3	39.6	59.4
Corsicana, Tex.....	44.7	51.5	59.5	65.4	73.1	79.3	84.2	82.5	75.9	66.8	55.0	48.5	64.9
Denison, Tex.....	43.1	49.2	56.8	64.2	71.6	77.4	82.4	80.4	73.8	63.7	51.1	44.4	62.8
Galveston, Tex.....	52.5	57.0	64.2	68.6	76.2	82.4	84.4	83.3	79.4	71.7	61.8	55.2	69.8
Indianola, Tex.....	52.6	57.9	65.4	69.1	76.0	81.9	83.9	83.0	79.2	72.1	61.9	55.1	69.9
San Antonio, Tex.....	51.6	55.2	66.5	70.7	77.2	81.5	83.6	83.5	78.8	71.4	58.4	52.3	66.8
<b>Rio Grande Valley:</b>													
Brownsville, Tex.....	58.0	61.6	69.8	75.0	80.3	83.8	85.4	84.2	80.0	75.7	65.6	57.6	72.7
Rio Grande City, Tex.....	58.9	61.2	74.5	78.1	83.2	86.4	87.9	83.3	79.8	73.2	67.5	64.7	.....
<b>Ohio Valley and Tennessee:</b>													
Knoxville, Tenn.....	37.2	40.4	47.9	56.2	66.4	73.3	77.4	74.3	67.8	56.1	45.1	38.3	56.7
Memphis, Tenn.....	40.0	44.3	52.2	59.8	70.8	77.7	82.1	78.7	71.0	59.9	49.0	41.6	60.7
Nashville, Tenn.....	38.6	42.5	49.8	57.6	69.8	77.4	81.7	78.2	70.3	58.7	47.3	40.3	59.6
Louisville, Ky.....	34.2	37.6	45.0	55.1	66.8	75.4	80.1	76.3	68.1	57.0	44.1	37.3	56.6
Indianapolis, Ind.....	29.6	33.2	40.3	51.9	63.9	72.6	77.3	73.8	65.2	54.3	40.4	33.3	53.2
Cincinnati, Ohio.....	33.5	36.5	43.2	53.6	65.6	74.5	79.1	75.0	67.4	56.9	43.8	36.5	55.6
Columbus, Ohio.....	25.4	29.0	41.4	50.5	65.1	71.7	78.9	79.6	63.2	57.2	42.7	36.4	.....
Morgantown, W. Va.....	33.8	35.3	41.2	50.8	62.1	71.1	75.2	71.3	64.1	53.6	41.8	36.1	53.1
Pittsburg, Pa.....	30.0	31.5	38.3	48.1	60.8	71.1	75.2	71.4	63.7	52.6	39.4	32.4	51.3
<b>Lower Lakes:</b>													
Buffalo, N. Y.....	24.4	24.0	30.6	40.5	53.2	65.0	70.3	69.1	61.6	50.4	38.8	28.3	46.2
Oswego, N. Y.....	26.1	25.5	32.5	42.6	54.6	65.1	70.9	69.4	62.4	51.2	38.6	29.7	47.5
Rochester, N. Y.....	23.9	24.0	31.1	42.6	56.5	66.8	71.5	69.4	61.3	49.0	35.7	27.4	46.8
Erie, Pa.....	27.7	27.3	34.1	43.7	57.7	68.6	73.3	71.1	63.6	52.9	40.1	32.5	49.5

*Mean temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army, &c.—Continued.*

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
<b>Lower Lakes—Cont'd.</b>	o	o	o	o	o	o	o	o	o	o	o	o	o
Cleveland, Ohio	26.3	27.2	34.2	44.2	58.0	67.9	72.5	70.3	63.2	52.4	38.6	30.1	48.9
Sandusky, Ohio	28.6	30.4	40.8	50.5	59.3	66.9	75.0	72.9	64.1	53.5	42.3	34.5	52.0
Toledo, Ohio	27.4	29.4	36.1	47.1	57.6	70.3	74.5	71.5	63.4	52.6	38.9	30.8	50.1
Detroit, Mich	23.7	25.8	32.1	43.7	57.4	67.3	71.9	70.0	61.8	50.4	36.2	27.7	47.4
<b>Upper Lakes:</b>													
Alpena, Mich	18.4	18.8	24.4	36.2	48.7	59.9	66.2	64.7	56.3	44.8	32.1	23.5	41.2
Escanaba, Mich	14.8	16.4	23.3	35.5	49.3	60.0	67.6	65.5	56.2	44.2	31.2	21.4	40.4
Grand Haven, Mich	25.3	26.8	32.0	43.3	55.5	64.7	70.1	68.6	60.6	50.0	37.0	29.8	47.0
Marquette, Mich	17.4	19.3	25.8	37.2	49.7	59.0	66.5	66.0	56.7	45.8	31.7	23.2	41.5
Port Huron, Mich	21.6	22.8	29.9	41.6	53.3	63.2	69.6	68.3	60.2	49.6	36.3	26.8	45.2
Chicago, Ill	25.0	28.8	35.6	45.0	56.8	66.8	73.1	71.9	63.5	51.9	37.9	29.7	49.0
Milwaukee, Wis	19.7	23.8	30.6	41.3	53.0	63.1	69.7	68.9	60.8	47.0	33.9	24.9	44.6
Duluth, Minn	11.8	18.1	25.4	38.5	49.0	57.7	67.4	67.2	56.2	44.8	28.9	18.0	40.4
<b>Upper Mississippi Valley:</b>													
Saint Paul, Minn	13.9	18.6	28.0	44.1	58.6	67.3	73.1	70.1	58.2	46.4	30.2	20.6	48.8
La Crosse, Wis	16.3	22.3	31.9	46.5	60.4	68.6	74.4	71.5	60.7	49.4	32.9	23.2	46.6
Davenport, Iowa	20.8	26.9	35.6	48.4	61.3	70.6	75.9	73.5	63.6	51.9	35.7	26.9	49.3
Des Moines, Iowa	18.9	25.2	39.6	50.7	63.7	69.9	77.4	75.6	63.8	55.0	42.0	19.8	48.3
Dubuque, Iowa	19.3	25.0	33.6	47.9	61.4	68.7	75.7	72.8	62.3	51.2	34.6	20.7	48.3
Keokuk, Iowa	24.8	30.5	38.7	50.5	63.2	72.6	78.2	75.4	65.9	54.2	37.9	29.2	51.8
Cairo, Ill	35.8	40.1	48.2	57.4	68.0	75.1	80.7	77.6	69.2	58.4	45.2	38.0	67.8
Saint Louis, Mo	33.1	36.1	43.5	54.0	66.0	74.5	79.7	76.6	67.3	57.0	42.2	34.7	55.5
<b>Missouri Valley:</b>													
Leavenworth, Kans	25.7	32.8	41.4	52.6	63.3	73.3	78.7	77.3	66.3	55.3	39.5	30.8	58.2
Omaha, Nebr	21.0	27.8	36.2	49.2	62.3	70.7	74.8	74.8	62.9	52.4	35.7	26.4	49.5
Yankton, Dak	14.9	21.4	30.1	45.2	59.4	67.9	74.1	72.2	60.8	48.8	31.8	21.8	45.3
<b>Extreme Northwest:</b>													
Breckenridge, Minn	2.9	8.4	19.2	39.4	55.3	63.8	69.1	66.3	54.0	42.9	23.2	11.5	37.9
Bismarck, Dak	6.3	11.8	22.1	41.4	54.7	62.3	70.6	67.9	55.8	43.5	24.2	17.3	39.8
Pembina, Dak	-0.2	7.4	15.1	35.9	52.9	61.8	67.2	64.2	52.0	39.0	19.0	8.6	36.0
<b>Northern Slope:</b>													
Benton, Fort, Mont	8.3	17.8	24.0	43.9	56.6	63.2	72.0	69.1	56.8	47.1	24.0	22.8	42.6
Cheyenne, Wyo	24.3	29.0	33.6	39.2	51.3	61.4	68.3	65.8	55.2	44.4	33.6	27.1	44.2
North Platte, Nebr	20.0	28.7	35.6	47.3	58.9	67.8	74.5	72.4	61.4	49.5	35.1	27.6	47.6
<b>Middle Slope:</b>													
Denver, Colo	26.1	33.6	40.4	45.4	55.7	66.8	72.6	70.4	60.5	50.4	38.5	29.0	49.0
Pike's Peak, Colo	3.6	3.8	7.8	12.1	22.0	31.9	40.1	39.0	33.4	22.0	11.4	5.4	18.8
Dodge City, Kans	25.8	35.8	42.4	53.3	64.4	72.6	78.4	76.1	67.5	55.8	39.7	32.4	53.3
<b>Southern Slope:</b>													
Sill, Fort, Ind. T	36.4	43.9	55.5	62.1	70.7	76.9	81.7	79.4	72.9	63.0	48.8	37.1	60.6
Concho, Fort, Tex	43.8	48.3	61.0	68.3	76.4	79.8	83.8	80.4	74.0	65.8	51.2	43.6	63.7
Davis, Fort, Tex	49.7	51.4	59.7	64.0	72.6	74.6	78.2	78.0	68.8	62.4	55.1	39.1	69.1
Stockton, Fort, Tex	44.6	49.6	59.6	68.8	76.2	78.6	81.6	79.4	73.3	64.0	50.8	43.1	62.9
<b>Southern Plateau:</b>													
La Mesilla, N. Mex	40.0	47.9	56.2	58.6	70.0	76.6	80.0	78.6	73.3	61.3	47.4	40.7	59.8
Santa Fe, N. Mex	28.7	32.1	40.2	44.9	55.9	65.2	68.2	66.3	59.4	49.8	37.6	30.0	47.9
El Paso, Tex	53.2	57.3	63.6	63.3	73.9	81.2	83.2	80.8	75.7	67.4	57.3	49.0	69.0
Apache, Fort, Ariz	33.3	42.6	50.6	51.8	58.5	66.1	73.1	71.4	65.2	54.3	44.4	33.6	58.6
Florence, Ariz	51.3	56.4	61.5	67.8	74.8	85.6	91.0	88.5	82.0	69.9	58.2	52.5	69.8
Grant, Fort, Ariz	45.1	52.9	60.7	59.2	68.6	76.1	79.8	77.6	73.7	64.2	52.1	44.2	64.2
Prescott, Ariz	30.1	38.1	43.5	48.6	55.4	66.8	74.2	71.0	64.2	53.0	41.8	35.1	52.8
Tucson, Ariz	48.2	53.8	60.1	64.0	72.1	82.8	87.0	84.1	79.0	69.4	56.6	48.8	66.5
Yuma, Ariz	54.8	62.0	67.2	69.9	77.0	87.2	93.3	91.8	85.1	74.3	62.2	56.1	73.2
<b>Middle Plateau:</b>													
Pioche, Nev	29.4	35.8	45.2	47.0	54.1	64.0	72.4	72.6	63.8	50.9	41.3	32.6	50.1
Winnemucca, Nev	28.7	38.2	45.4	48.6	52.4	61.9	72.0	72.2	61.5	47.7	39.6	29.0	49.8
Salt Lake City, Utah	29.5	36.2	43.4	49.4	57.4	67.0	76.1	75.0	64.9	53.7	41.9	31.7	51.7
<b>Northern Plateau:</b>													
Boise City, Idaho	30.5	40.0	47.7	52.0	55.9	66.8	73.3	73.9	62.1	49.0	42.0	31.0	52.4
Umatilla, Oreg	32.0	40.3	50.6	54.0	59.8	68.8	73.9	75.1	64.4	51.5	43.9	34.2	54.8
<b>North Pacific Coast:</b>													
Olympia, Wash	38.5	42.4	46.2	48.2	53.6	58.7	61.9	63.1	55.8	48.7	45.8	41.4	50.8
Portland, Oreg	39.8	43.8	47.7	52.5	56.0	61.9	67.2	66.1	61.5	54.0	45.8	41.8	53.3
Roseburg, Oreg	40.8	46.2	50.6	61.2	54.6	61.8	65.8	66.9	60.9	53.1	47.6	40.4	53.1
<b>Middle Pacific Coast:</b>													
Red Bluff, Cal	45.8	51.0	56.2	61.0	65.1	80.2	82.5	82.2	75.9	64.3	54.8	47.3	64.0
Sacramento, Cal	47.6	53.2	57.0	69.8	62.8	72.0	73.4	73.7	70.7	62.4	55.1	47.9	61.3
San Francisco, Cal	51.3	52.8	54.3	55.0	56.2	59.2	58.2	58.8	60.0	59.9	57.1	51.8	56.2
<b>South Pacific Coast:</b>													
Campano, Cal	41.0	45.5	49.5	51.6	55.4	63.3	68.2	68.5	64.0	56.7	48.7	44.3	54.2
Los Angeles, Cal	53.6	55.0	57.2	58.2	61.6	65.4	68.5	69.4	67.5	63.6	60.2	55.2	60.7
San Diego, Cal	54.6	56.0	56.1	57.9	60.8	64.3	67.5	68.9	66.9	63.5	59.2	55.3	60.9
Visalia, Cal	46.8	53.2	57.8	60.4	65.5	76.4	79.2	78.6	72.4	61.1	52.6	46.2	61.9
<b>Alaska Stations:</b>													
Saint Michael's, Fort, Alaska	8.4	-3.4	7.4	19.5	32.6	46.9	53.8	51.5	44.2	29.4	13.0	5.9	25.3

## APPENDIX 10.

*Mean temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army, for each month and the year. (Computed from November, 1879, to December, 1884, both inclusive, except at stations opened subsequent to the former date.)*

[The daily means are obtained by dividing the sum of the 7 a. m., 8 and 11 p. m. (Washington time), observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
<b>New England:</b>	°	°	°	°	°	°	°	°	°	°	°	°	°
Eastport, Me. ....	19.8	23.2	27.9	37.8	47.1	56.2	60.5	61.1	56.5	46.7	36.1	25.7	41.6
Portland, Me. ....	24.6	28.7	34.0	44.7	55.1	65.0	69.6	68.6	62.3	51.0	39.6	30.1	47.8
Mount Washington, N. H. ....	6.1	8.8	9.6	20.1	34.2	44.3	46.7	47.2	42.6	30.2	17.2	11.3	26.5
Boston, Mass. ....	26.4	30.1	33.9	43.6	55.3	65.8	69.9	68.8	63.5	51.7	40.0	31.4	48.4
Block Island, R. I. ....	30.1	33.8	35.9	42.8	51.9	62.4	68.5	68.4	64.7	55.3	44.9	36.1	49.6
New Haven, Conn. ....	26.5	30.6	34.5	45.2	57.3	66.9	70.9	69.5	66.0	58.0	46.8	31.8	49.3
New London, Conn. ....	28.8	32.1	35.9	45.3	56.4	65.7	70.3	69.8	65.1	54.3	42.3	33.5	49.9
<b>Middle Atlantic States:</b>													
Albany, N. Y. ....	25.0	30.0	34.8	47.8	61.2	70.1	73.2	71.9	65.9	53.0	40.4	30.4	50.4
New York City ....	30.0	33.6	36.7	47.0	59.3	68.3	72.6	71.6	67.5	56.2	43.2	34.4	51.6
Philadelphia, Pa. ....	31.7	37.1	40.2	49.9	62.6	71.5	75.1	73.7	69.3	57.7	44.6	35.1	54.1
Atlantic City, N. J. ....	32.4	35.7	38.6	46.7	57.8	66.9	72.6	71.6	68.8	58.5	44.6	36.8	52.5
Barnegat City, N. J. ....	31.9	35.1	38.3	46.0	57.2	66.5	72.2	71.1	68.0	57.7	44.2	36.4	52.0
Cape May, N. J. ....	34.8	39.0	41.4	48.9	60.0	68.5	74.1	72.9	70.1	60.6	48.0	39.4	54.7
Sandy Hook, N. J. ....	30.8	34.1	37.6	47.1	58.5	68.8	74.0	72.8	69.0	57.9	45.0	35.8	52.7
Delaware Breakwater, Del. ....	32.1	38.6	40.4	48.1	58.7	68.2	73.2	72.4	69.9	60.8	47.5	38.2	54.0
Baltimore, Md. ....	34.4	39.7	42.5	52.6	65.3	73.6	76.9	74.9	70.2	58.6	46.0	38.3	56.1
Washington City ....	32.3	38.5	41.2	51.7	64.9	73.0	76.2	74.3	70.2	59.0	47.7	38.5	55.1
Cape Henry, Va. ....	39.9	45.0	46.4	54.0	65.2	73.3	77.3	76.1	73.4	64.6	52.2	44.6	59.2
Chincoteague, Va. ....	33.5	39.2	41.4	49.4	60.2	69.5	74.4	73.1	70.5	61.3	47.9	38.9	55.0
Lynchburg, Va. ....	37.5	43.8	46.1	55.9	68.0	74.8	78.0	76.0	71.1	61.1	46.7	40.4	48.2
Norfolk, Va. ....	40.7	46.6	48.0	55.6	67.6	75.2	78.9	76.7	73.1	63.7	51.2	44.6	60.1
<b>South Atlantic States:</b>													
Charlotte, N. C. ....	41.5	48.3	50.4	58.8	69.0	76.1	79.4	76.7	71.8	63.3	49.8	43.8	60.6
Hatteras, N. C. ....	43.2	48.8	50.0	55.2	66.0	74.2	78.2	77.4	75.3	67.6	56.2	47.3	61.8
Kitty Hawk, N. C. ....	42.2	46.7	47.5	53.6	64.8	73.5	78.2	76.3	74.0	65.5	53.6	44.4	60.1
Macon, Fort, N. C. ....	43.8	49.8	51.4	57.1	68.0	75.0	78.8	77.7	75.0	67.6	55.5	48.4	62.4
Smithville, N. C. ....	47.3	51.9	53.9	60.2	70.2	77.0	80.7	78.8	74.8	66.8	54.6	49.4	63.7
Wilmington, N. C. ....	48.3	53.5	55.0	61.2	70.1	76.7	79.9	78.2	74.6	67.0	55.1	50.2	64.1
Charleston, S. C. ....	51.6	56.3	58.3	64.3	72.8	79.5	82.8	80.6	76.9	68.6	57.8	53.4	66.9
Augusta, Ga. ....	48.8	54.9	57.3	64.1	72.4	78.7	81.9	79.5	75.6	68.2	54.8	50.2	65.5
Savannah, Ga. ....	53.1	57.6	60.6	66.7	73.9	80.8	83.3	80.5	76.6	68.5	56.6	54.6	67.9
Jacksonville, Fla. ....	57.4	61.4	64.2	69.6	74.9	80.7	82.9	81.0	77.7	72.6	62.5	58.4	70.2
<b>Florida Peninsula:</b>													
Cedar Keys, Fla. ....	58.2	62.3	64.5	70.5	76.0	80.7	82.7	81.7	79.6	74.1	63.6	59.7	71.1
Key West, Fla. ....	71.8	73.1	73.9	77.2	80.0	83.7	85.3	84.2	82.7	79.4	75.4	71.9	78.2
Sanford, Fla. ....	55.6	65.3	68.4	70.8	75.5	78.6	82.4	80.4	78.8	74.8	67.1	64.0	71.6
<b>Eastern Gulf States:</b>													
Atlanta, Ga. ....	44.1	50.0	53.0	61.0	69.1	75.4	78.5	75.8	72.0	65.1	51.2	46.1	61.7
Pensacola, Fla. ....	54.1	58.4	61.8	67.9	73.9	79.7	81.0	80.3	77.3	71.9	59.4	55.4	68.4
Mobile, Ala. ....	52.3	57.1	61.2	68.0	74.4	80.7	81.1	80.4	77.3	71.4	58.8	53.4	68.0
Montgomery, Ala. ....	49.5	55.1	58.4	65.5	72.9	79.1	81.3	79.6	76.0	69.7	55.3	50.6	66.0
Vicksburg, Miss. ....	49.0	54.9	59.4	66.4	73.1	79.9	81.3	80.3	75.4	68.9	55.3	51.8	66.2
New Orleans, La. ....	55.9	60.5	63.9	70.0	75.6	81.1	83.0	82.0	78.9	73.2	61.4	57.4	70.2
<b>Western Gulf States:</b>													
Shreveport, La. ....	46.8	52.1	58.9	66.8	73.6	81.0	83.1	81.7	75.3	68.4	54.4	50.0	65.8
Fort Smith, Ark. ....	32.0	40.8	50.7	59.4	68.0	76.8	79.6	76.7	72.5	64.5	51.3	40.4	56.5
Little Rock, Ark. ....	42.5	48.0	54.1	62.7	70.0	77.9	80.0	78.6	75.6	65.5	51.5	45.8	62.3
Galveston, Tex. ....	53.6	58.3	64.0	69.9	76.3	82.4	84.0	82.4	80.1	74.7	63.2	57.3	70.5
Indianola, Tex. ....	53.0	58.2	64.7	70.8	76.4	82.0	83.2	82.3	79.4	74.6	62.3	57.3	70.2
Palestine, Tex. ....	42.0	54.0	60.8	65.2	70.6	76.8	81.5	79.6	75.8	68.7	56.7	49.7	65.0
<b>Rio Grande Valley:</b>													
Brownsville, Tex. ....	58.6	62.9	68.8	74.1	78.8	82.6	83.4	82.2	79.4	75.5	63.4	61.8	72.6
Rio Grande City, Tex. ....	57.6	64.4	69.7	76.2	80.3	85.3	86.8	83.1	82.5	74.8	63.6	60.2	73.1
<b>Ohio Valley and Tennessee:</b>													
Chattanooga, Tenn. ....	41.9	48.0	51.5	60.0	68.2	75.0	77.6	75.9	71.1	63.8	49.6	43.6	60.4
Knoxville, Tenn. ....	39.0	45.4	48.4	57.6	66.9	73.2	75.2	74.4	70.2	62.4	47.9	40.4	58.2
Memphis, Tenn. ....	40.8	47.0	52.1	62.0	70.6	78.0	80.4	78.9	72.6	65.2	50.1	43.7	61.7

*Mean temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army, for each month and the year, &c.—Continued.*

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
<b>Ohio Valley and Tennessee—</b>													
Continued:	°	°	°	°	°	°	°	°	°	°	°	°	°
Nashville, Tenn.	39.6	45.8	49.7	59.6	69.2	76.2	78.2	77.4	71.5	64.1	48.6	41.6	60.0
Louisville, Ky.	35.7	42.1	45.1	56.0	66.9	74.0	77.1	76.0	70.4	60.9	49.0	38.8	57.4
Indianapolis, Ind.	29.5	35.5	40.1	51.9	64.0	72.5	75.3	74.1	67.6	57.0	41.5	32.4	53.3
Cincinnati, Ohio.	31.8	41.0	44.2	54.3	65.6	73.8	77.0	75.6	70.4	60.2	45.3	37.6	56.5
Columbus, Ohio.	29.5	35.8	39.1	50.0	62.8	70.8	74.1	72.5	67.4	56.2	41.2	33.2	52.6
Pittsburg, Pa.	31.7	36.4	38.6	50.3	63.1	70.6	72.8	71.9	67.9	57.0	42.5	34.8	53.1
<b>Lower Lakes:</b>													
Buffalo, N. Y.	24.0	26.6	29.4	40.1	53.6	63.8	68.1	68.5	63.9	51.5	38.6	30.2	46.5
Oswego, N. Y.	25.7	28.9	31.6	41.9	54.9	63.7	68.7	68.6	63.5	51.4	39.4	30.4	47.4
Rochester, N. Y.	23.4	27.3	30.9	42.0	56.8	64.9	68.8	69.0	63.1	50.9	37.6	29.0	47.5
Erie, Pa.	27.4	30.7	33.1	43.6	57.5	66.3	70.3	69.7	64.9	54.5	40.9	32.7	49.2
Cleveland, Ohio.	25.9	30.7	33.3	44.2	58.3	67.0	70.4	69.4	65.2	54.2	39.5	30.5	49.0
Sandusky, Ohio.	27.4	32.0	35.1	45.6	60.7	68.5	72.2	71.4	66.4	55.0	40.6	31.8	50.8
Toledo, Ohio.	27.3	32.0	36.0	46.9	60.4	69.3	73.1	71.4	66.2	54.8	40.8	31.8	50.8
Detroit, Mich.	25.8	31.0	34.6	45.6	58.7	67.8	71.2	70.8	65.2	54.3	40.0	31.2	49.7
<b>Upper Lakes:</b>													
Alpena, Mich.	18.0	19.6	24.1	36.1	49.2	59.0	64.3	64.0	58.0	46.3	32.2	23.6	41.2
Escanaba, Mich.	14.0	16.8	22.6	35.7	50.1	61.0	65.3	64.1	57.6	46.3	30.7	21.0	40.5
Grand Haven, Mich.	23.2	27.9	31.8	43.2	56.0	64.5	68.3	67.7	62.5	51.6	38.4	29.6	47.2
MacKinaw City, Mich.	14.8	14.0	20.2	36.6	46.2	59.9	61.9	62.1	57.8	48.5	35.7	25.5	40.0
Marquette, Mich.	16.5	17.7	23.5	36.5	49.5	58.1	63.8	63.2	56.9	46.0	30.8	22.2	40.5
Port Huron, Mich.	21.5	25.5	29.0	40.1	53.3	62.8	67.0	67.3	62.3	50.2	35.6	26.9	45.1
Chicago, Ill.	24.7	29.6	34.8	45.2	57.1	65.1	70.8	71.1	65.3	54.3	39.3	29.2	48.8
Milwaukee, Wis.	20.4	25.8	31.1	42.3	54.2	62.1	67.8	68.1	61.6	51.5	33.6	25.0	45.5
Duluth, Minn.	10.0	15.2	24.2	37.8	48.3	58.2	65.2	64.1	56.4	45.7	28.3	14.9	39.1
<b>Upper Mississippi Valley:</b>													
Saint Paul, Minn.	12.4	18.4	28.6	44.9	58.5	67.0	69.9	69.6	59.9	48.6	31.0	17.6	43.9
La Crosse, Wis.	12.0	22.7	31.0	47.0	60.7	69.1	71.5	70.8	62.7	51.4	34.2	21.6	46.6
Davenport, Iowa.	26.9	28.9	35.4	49.5	62.0	69.8	73.6	72.7	65.5	54.5	39.1	28.0	50.2
Des Moines, Iowa.	20.3	25.8	34.3	49.0	60.9	69.5	72.7	72.0	63.9	52.7	36.4	24.3	48.5
Dubuque, Iowa.	19.0	25.0	33.0	47.8	60.6	68.4	72.0	71.1	63.3	52.1	35.8	24.2	47.8
Keokuk, Iowa.	24.5	30.6	37.6	51.8	63.5	71.8	76.0	74.7	67.5	56.6	39.9	28.5	51.8
Cairo, Ill.	35.9	42.5	47.6	58.8	68.1	75.9	78.5	77.3	70.7	62.2	47.4	39.1	58.5
Springfield, Ill.	27.8	34.1	40.0	53.0	63.8	71.5	75.3	74.0	67.1	56.7	41.8	31.7	53.0
Saint Louis, Mo.	29.7	36.0	42.1	54.9	65.2	73.3	77.0	76.1	70.1	59.0	44.0	34.1	55.1
<b>Missouri Valley:</b>													
Leavenworth, Kans.	27.0	32.2	41.0	53.7	64.3	73.5	76.7	75.2	67.8	56.4	41.2	30.5	53.3
Omaha, Nebr.	20.5	25.2	34.7	49.7	62.5	72.1	75.5	73.9	65.2	53.5	37.0	23.7	49.5
Bennett, Fort, Dak.	10.4	16.2	28.4	43.0	56.5	65.2	70.8	71.8	60.1	46.3	32.2	18.3	43.6
Huron, Dak.	9.8	14.4	27.7	43.6	52.6	66.8	68.8	68.6	58.0	46.8	30.4	17.8	41.8
Yankton, Dak.	15.9	18.8	29.4	44.8	59.7	69.7	72.4	72.3	61.8	48.5	32.5	19.0	45.6
<b>Extreme Northwest:</b>													
Moorhead, Minn.	-2.7	5.0	16.8	37.8	58.3	64.8	66.4	66.2	55.4	42.6	23.6	9.7	36.6
Saint Vincent, Minn.	-6.8	1.5	12.7	33.5	51.2	62.1	63.4	63.4	52.4	39.6	19.3	4.5	33.2
Blamarek, Dak.	5.4	10.9	21.2	38.5	55.2	65.3	67.8	67.7	56.8	43.0	25.9	10.0	39.0
Buford, Fort, Dak.	5.1	10.2	22.1	39.2	53.7	64.3	66.5	66.7	53.7	41.4	24.9	8.0	38.1
<b>Northern Slope:</b>													
Assinaboine, Fort, Mont.	10.5	13.4	28.6	41.4	52.5	63.5	66.2	65.7	53.2	40.5	28.5	16.9	40.3
Benton, Fort, Mont.	16.0	19.4	33.4	41.8	53.2	63.2	68.8	68.6	55.5	41.8	30.3	19.9	42.6
Custer, Fort, Mont.	17.4	20.4	31.7	44.0	54.5	64.5	70.0	70.0	57.0	45.2	31.5	18.1	43.6
Helena, Mont.	15.0	19.7	33.4	41.4	51.6	61.1	66.6	67.2	56.0	42.9	30.6	20.4	42.6
Maginnis, Fort, Mont.	17.4	13.6	28.8	37.6	47.6	59.4	61.5	63.5	51.5	39.5	32.5	20.1	38.8
Poplar River, Mont.	2.2	4.5	28.7	38.6	55.0	63.7	64.0	66.0	54.4	42.7	23.5	-2.0	36.3
Shaw, Fort, Mont.	17.3	19.7	32.3	39.5	49.9	59.7	63.2	63.3	52.4	40.6	30.7	21.5	41.2
Deadwood, Dak.	21.4	22.3	29.9	38.0	49.0	60.4	62.9	65.4	53.4	43.2	31.2	21.8	41.2
Cheyenne, Wyo.	24.9	25.8	32.8	39.8	49.8	60.7	65.7	64.8	55.5	43.5	32.9	27.6	43.5
North Platte, Nebr.	21.0	24.1	35.6	46.8	57.9	68.8	72.5	71.7	62.0	49.6	33.8	23.1	47.4
<b>Middle Slope:</b>													
Denver, Colo.	30.8	39.5	39.6	47.2	55.4	66.9	72.3	70.5	62.0	50.1	36.3	31.7	49.4
Pike's Peak, Colo.	1.8	3.4	7.2	13.0	21.8	33.6	39.7	38.1	30.7	20.5	10.0	6.7	18.9
West Las Animas, Colo.	31.9	36.9	40.9	48.4	57.2	68.9	75.1	72.1	65.4	52.5	36.9	26.0	49.2
Dodge City, Kans.	27.4	30.8	41.8	52.2	61.6	73.2	76.2	73.9	67.0	54.6	38.0	28.1	52.2
Elliot, Fort, Tex.	31.7	35.5	45.7	55.5	63.1	73.2	76.0	74.0	67.9	57.4	41.0	33.8	54.6
<b>Southern Slope:</b>													
Sill, Fort, Ind. T.	36.9	41.8	50.5	62.2	69.1	78.4	81.1	79.7	72.9	62.6	46.8	37.7	60.2
Concho, Fort, Tex.	42.8	43.3	56.9	64.0	71.2	79.9	81.7	79.1	72.9	64.8	51.2	46.1	68.1
Davis, Fort, Tex.	42.4	47.8	53.7	59.2	67.0	74.9	75.7	71.0	65.1	50.5	45.9	45.5	59.2
Stockton, Fort, Tex.	43.1	48.5	56.1	62.5	70.5	79.1	80.2	76.8	71.0	63.2	50.4	46.8	62.2
<b>Southern Plateau:</b>													
Santa Fe, N. Mex.	27.2	31.6	38.6	46.6	55.4	65.9	68.0	64.9	58.0	48.5	35.0	30.2	48.8
El Paso, Tex.	43.4	48.9	56.4	63.0	71.5	80.8	81.8	78.0	71.2	62.1	49.5	45.8	62.5
Apache, Fort, Ariz.	33.8	37.4	43.5	49.4	56.7	67.0	71.9	69.0	62.1	52.7	40.3	30.5	51.7
Grant, Fort, Ariz.	42.1	44.3	50.0	57.0	65.8	76.1	77.3	73.4	70.0	60.7	49.7	47.1	59.8
Prescott, Ariz.	34.5	36.0	42.5	49.1	57.0	66.4	71.4	69.1	62.1	51.7	40.9	37.6	51.5
Thomas, Camp, Ariz.	40.1	46.8	53.2	59.5	68.4	78.9	83.2	80.1	72.7	59.5	48.0	43.3	61.4
Yuma, Ariz.	52.8	56.3	62.5	68.3	76.3	84.5	91.4	90.1	82.9	69.9	59.7	55.4	70.8

*Mean temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army, for each month and the year, &c.—Continued.*

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
<b>Middle Plateau:</b>	°	°	°	°	°	°	°	°	°	°	°	°	°
Winnemucca, Nev. ....	28.9	30.0	38.9	48.2	53.4	63.5	71.7	69.2	59.7	44.9	33.0	32.4	48.0
Salt Lake City, Utah .....	27.9	29.7	40.0	47.9	57.1	68.5	74.4	74.2	63.2	49.6	36.1	33.6	50.3
<b>Northern Plateau:</b>													
Boise City, Idaho .....	28.5	30.6	41.5	49.0	57.2	66.0	72.1	71.1	58.6	47.0	36.6	31.8	49.4
Lewiston, Idaho .....	31.6	30.4	43.2	50.8	58.6	66.9	72.8	72.0	59.7	49.0	38.0	31.3	50.4
Dayton, Wash. ....	30.9	29.1	42.4	48.9	55.9	68.0	67.4	66.7	58.2	48.1	37.4	30.5	48.2
Spokane Falls, Wash. ....	23.7	24.2	38.6	47.4	55.7	68.8	67.9	67.3	55.7	47.1	35.9	27.6	48.2
<b>North Pacific Coast:</b>													
Canby, Fort, Wash. ....	42.0	38.2	44.0	50.5	58.4	55.2	58.6	60.7	57.6	51.8	42.1	25.8	49.9
Olympia, Wash. ....	37.8	36.9	43.3	48.0	53.1	58.4	61.1	61.5	55.6	48.9	43.2	39.3	48.9
Tatoosh Island, Wash. ....	41.5	36.6	42.7	49.2	50.9	53.3	55.8	55.4	52.9	49.1	46.4	39.4	47.8
Portland, Oreg. ....	39.3	38.0	46.0	51.1	56.6	61.7	64.8	64.2	58.9	52.9	44.4	40.1	51.4
Roseburg, Oreg. ....	39.8	39.8	45.9	50.5	56.0	61.8	65.5	63.8	59.9	50.1	43.1	41.5	51.5
<b>Middle Pacific Coast:</b>													
Cape Mendocino, Cal. ....	48.6	44.6	48.6	47.8	51.0	54.6	53.8	55.0	57.2	53.3	51.9	49.0	51.2
Red Bluff, Cal. ....	45.3	47.0	53.7	57.9	66.8	74.9	82.3	79.3	72.3	60.2	53.7	46.6	61.6
Sacramento, Cal. ....	45.3	47.7	53.4	56.8	63.4	67.9	71.9	70.7	68.1	59.1	51.1	46.1	58.5
San Francisco, Cal. ....	49.3	49.7	52.5	53.9	57.0	57.9	58.8	58.1	59.2	57.4	54.2	51.2	55.0
<b>South Pacific Coast:</b>													
Los Angeles, Cal. ....	53.0	53.1	54.7	57.6	61.8	65.6	68.2	69.6	67.5	61.8	57.4	54.5	60.4
San Diego, Cal. ....	52.8	53.5	55.1	57.8	61.4	64.5	66.9	68.5	66.3	61.5	57.2	55.6	60.1
<b>Alaska Stations:</b>													
Saint Michael's, Fort, Alaska	5.3	1.6	10.8	19.0	33.2	46.2	53.7	52.5	43.5	31.3	19.0	4.4	26.7
Sitka, Alaska .....	37.0	33.7	37.0	42.7	48.6	51.2	53.8	55.8	51.9	45.1	42.2	35.2	43.9
Unalakshka, Alaska .....	31.3	33.8	33.0	35.0	39.4	45.8	50.4	50.4	47.0	42.0	34.7	32.0	40.6
Behring's Island, Behring													
Sea .....	25.7	26.8	26.8	29.6	36.0	42.2	47.4	51.3	47.2	38.1	30.4	27.4	35.7

## APPENDIX II.

*Mean monthly temperature, and departure (of 1884) therefrom, in degrees Fahrenheit, at selected stations of the Signal Service, United States Army. (This normal has been computed for the decade ending December 31, 1884.)*

[The daily means are obtained by dividing the sum of the three observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month. Observations from January 1, 1879, to November 1, 1879, taken at 7.35 a. m., 4.35 and 11 p. m., Washington time, and from November 1, 1879, to December 31, 1884, at 7 a. m., 8 and 11 p. m., Washington time.]

Stations.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -
<b>New England:</b>																								
Eastport, Me.	19.0	-1.4	22.8	+1.9	28.5	-0.3	38.2	+1.7	47.2	-0.7	55.5	+1.9	60.4	-1.8	61.5	+0.0	55.8	+0.7	46.7	-1.3	36.0	+0.4	25.2	+1.1
Portland, Me.	23.6	-1.2	27.5	+2.2	33.9	-0.2	44.4	+1.3	55.4	-1.5	64.6	+2.2	69.9	-2.4	68.5	-1.1	61.3	+2.7	50.9	-0.3	39.4	-0.3	31.2	+0.5
Mount Washington, N. H.	4.4	+0.8	6.9	+7.2	11.2	+1.0	21.1	+4.3	32.9	-0.9	44.4	+4.6	47.6	-3.0	47.6	-1.0	41.0	+0.4	30.3	-1.6	17.6	-0.7	10.2	+1.7
Boston, Mass.	25.7	-1.9	25.5	+2.5	34.1	-0.6	43.7	-1.0	54.0	-2.2	65.9	+0.1	70.8	-2.8	69.1	-0.8	62.3	+8.5	51.7	+0.6	39.7	+1.4	30.4	+2.7
New Haven, Conn.	27.5	-4.3	30.4	+1.3	35.8	-2.2	46.3	-1.4	58.3	-2.4	67.8	-1.0	72.7	-4.9	70.8	-1.7	64.6	+1.9	53.8	-0.6	41.4	-0.5	31.9	+0.4
New London, Conn.	28.5	-2.4	30.9	+2.7	36.2	-0.4	45.6	-0.2	56.5	-0.7	65.8	-0.7	71.0	-3.5	70.5	-1.5	64.1	+2.8	54.3	+0.4	43.8	+0.6	32.8	+1.7
<b>Middle Atlantic States:</b>																								
Albany, N. Y.	29.6	+0.9	26.3	+6.8	33.0	-2.8	46.1	+1.7	59.5	-0.4	68.8	+2.7	72.6	-1.9	71.3	+1.3	63.4	+4.1	51.5	-0.3	39.3	-0.8	28.6	+0.8
New York City.	22.7	-3.4	32.1	+3.0	37.0	-0.5	47.0	-0.6	59.1	-0.3	68.3	-0.4	73.4	-3.3	72.9	-0.5	65.0	+3.6	55.7	+0.4	43.2	+0.6	33.6	+1.0
Philadelphia, Pa.	31.2	-1.7	34.8	+5.5	39.8	-1.7	49.8	-1.1	62.1	-0.8	71.2	-0.7	75.8	-4.0	73.1	-1.3	67.3	+2.5	54.9	+0.3	44.4	-0.6	35.0	+0.4
Atlantic City, N. J.	31.6	-2.4	34.1	+3.5	38.5	-0.1	46.7	+1.3	57.4	+1.3	66.2	-0.2	72.4	-1.8	72.3	-0.7	67.2	+2.5	57.3	+1.7	44.8	+1.1	35.6	+1.9
Barnegat City, N. J.	30.9	-2.0	33.2	+4.6	38.0	-1.0	46.1	+0.8	57.1	+1.6	65.2	-0.7	71.2	-1.7	71.8	-0.7	66.7	+2.6	56.6	+1.7	44.1	+3.3	35.2	+3.4
Cape May, N. J.	34.1	-2.5	37.0	+2.5	41.1	-1.1	48.6	-0.4	59.3	+1.0	68.5	-0.8	74.1	-1.7	73.5	-0.8	68.8	+2.6	59.8	+0.9	47.7	+0.6	38.5	+1.5
Sandy Hook, N. J.	30.5	-2.8	32.8	+3.0	37.7	-0.3	46.9	+0.8	59.2	+0.3	68.8	-0.4	74.1	-3.4	73.0	-0.7	67.3	+3.7	58.5	+1.7	46.0	-0.2	35.6	+1.1
Baltimore, Md.	34.0	-2.0	37.7	+4.5	42.6	-1.4	52.8	-0.4	64.6	+0.2	73.5	-0.4	78.1	-3.0	75.4	+0.2	68.1	+3.2	58.5	+1.7	45.0	+0.3	37.4	+1.0
Washington City.	32.6	-3.2	36.9	+4.0	41.8	-0.4	52.1	-1.2	64.2	+0.9	73.1	-2.0	78.0	-3.4	74.4	-1.3	68.1	+2.1	57.7	+1.9	45.7	+0.1	35.7	+0.3
Cape Henry, Va.	40.0	-3.7	43.2	+3.5	46.9	-0.1	54.1	-2.1	64.3	+0.9	73.1	-2.0	78.0	-3.4	74.4	-1.3	68.1	+2.1	57.7	+1.9	45.7	+0.1	35.7	+0.3
York, Va.	37.2	-4.0	41.8	+3.8	46.9	+0.8	55.2	-2.1	67.0	+0.4	74.8	-3.2	79.6	-3.0	74.2	-1.4	69.5	+2.7	59.8	+2.8	47.0	-1.1	39.6	+1.5
Norfolk, Va.	40.3	-2.1	44.0	+6.1	48.4	+1.9	55.6	-1.1	66.5	+1.6	75.4	-2.0	79.8	-2.4	77.0	-1.0	71.4	+2.5	62.0	+2.0	50.6	+2.0	43.0	+2.3
<b>South Atlantic States:</b>																								
Wilmington, N. C.	47.1	-2.8	50.4	+3.1	54.9	+3.2	60.8	-0.3	68.8	+2.7	75.8	-1.9	80.0	-0.3	78.0	-1.1	73.4	+1.8	64.4	+3.7	54.4	+3.0	48.5	+2.7
Charleston, S. C.	51.0	-4.4	53.6	+5.1	58.3	+1.5	64.0	-0.2	72.6	+2.2	79.3	-3.7	83.2	-1.0	80.9	-2.0	75.0	+0.8	67.8	+3.4	57.7	+1.4	51.9	+1.8
Augusta, Ga.	48.2	-4.8	51.9	+4.6	57.2	+2.4	63.7	-1.6	72.6	+1.4	78.5	-4.3	82.6	-1.7	79.8	-0.7	75.0	+1.4	65.9	+3.7	54.6	+0.3	48.5	+2.8
Savannah, Ga.	52.7	-1.1	55.1	+3.2	60.3	+1.4	66.0	-0.2	73.8	+2.8	80.2	-4.6	83.7	-1.3	80.9	-0.3	76.2	+0.2	67.8	+2.8	59.4	+0.3	53.2	+1.2
Jacksonville, Fla.	56.4	-6.7	58.8	+3.3	63.3	+2.8	69.0	-0.3	75.2	+1.3	80.6	-3.7	83.1	-0.2	81.1	-1.3	77.9	+0.0	70.9	+1.9	62.1	-0.4	56.6	+1.8
<b>Florida Peninsula:</b>																								
Key West, Fla.	71.0	-2.7	71.8	+0.7	73.6	+1.0	76.5	-0.3	79.8	+1.1	83.2	-1.5	84.5	+0.5	84.3	-0.4	82.9	-0.7	79.4	-1.1	75.0	-0.1	70.6	+2.4
<b>Eastern Gulf States:</b>																								
Mobile, Ala.	51.4	-7.9	54.8	+2.5	60.5	+1.7	67.1	-0.9	74.0	+0.0	80.9	-3.1	82.4	-2.3	80.2	-1.5	76.8	+1.5	68.3	+2.4	58.3	-2.8	52.3	+1.6

Mean monthly temperature, and departures (of 1884) therefrom, in degrees Fahrenheit, at selected stations of the Signal Service, &c.—Continued.

Stations.	January.		February.		March.		April.		May.		June.		July.		August.		Septem-ber.		October.		Novem-ber.		December.	
	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -
<b>Eastern Gulf States—Continued.</b>																								
Montgomery, Ala.....	49.2	-2.7	52.9	+2.5	53.0	+1.9	63.0	+1.6	72.3	+1.3	79.5	+2.9	83.5	-1.5	79.9	-1.5	73.5	+3.5	66.9	+4.6	55.3	+1.3	49.6	+1.6
Vicksburg, Miss.....	48.3	-7.5	53.0	+2.6	59.6	+0.4	63.3	-1.9	72.3	+1.3	79.5	-2.4	83.5	+0.3	79.8	+0.3	74.7	+3.5	61.4	+2.6	50.6	+0.6	46.0	+0.3
New Orleans, La.....	53.2	-8.1	53.4	+2.3	63.4	+1.4	63.3	-1.6	75.4	+1.9	81.0	-1.6	83.1	+0.8	81.8	+0.5	73.0	+2.9	71.4	+3.0	61.2	-1.5	56.0	+2.7
<b>Western Gulf States:</b>																								
Shreveport, La.....	46.4	-7.5	51.7	+2.0	59.8	+0.2	63.3	-2.5	72.6	-2.0	80.0	-1.2	83.3	+2.9	81.4	-0.6	74.8	+5.4	66.7	+1.3	54.4	-1.3	49.0	-2.3
Galveston, Tex.....	53.1	-8.4	57.4	+2.4	64.9	+0.8	70.4	-2.4	76.5	-0.6	82.5	-1.1	84.5	+0.7	83.3	+0.5	79.2	+1.8	72.4	+1.4	62.0	+0.1	56.0	+2.2
Indianola, Tex.....	52.7	-6.0	57.3	+2.4	64.9	+0.8	70.4	-2.4	76.5	-1.0	82.5	-1.8	84.5	-0.4	83.6	-0.7	79.2	+1.8	72.5	+0.5	62.1	+0.6	56.2	+2.2
<b>Ohio Valley and Tennessee:</b>																								
Knoxville, Tenn.....	37.2	-7.4	42.6	+4.0	48.3	+0.8	57.0	-1.9	66.4	+0.4	72.9	-1.1	76.5	-1.7	74.2	-1.0	68.8	+3.6	60.6	+5.1	46.7	-0.4	39.5	+0.7
Memphis, Tenn.....	40.3	-7.3	45.7	+2.1	52.4	+0.1	61.6	-2.1	70.6	-1.0	77.4	-1.9	81.3	+0.5	78.3	-0.5	71.4	+5.5	63.0	+3.3	49.9	+1.3	43.0	-1.7
Nashville, Tenn.....	39.1	-9.0	43.9	+2.1	49.9	-0.8	59.5	-2.3	69.3	-1.0	76.2	-3.1	80.0	-1.9	77.3	-1.9	70.4	+3.9	61.7	+3.5	48.4	-0.2	41.1	-0.7
Louisville, Ky.....	35.0	-7.6	39.8	+2.8	45.3	+1.4	54.2	-1.5	63.7	-0.9	71.0	+0.2	73.7	-2.3	75.8	-1.0	68.7	+5.6	59.4	+3.9	46.3	+1.3	38.4	-0.8
Indianapolis, Ind.....	29.5	-7.9	34.4	+0.3	40.3	+0.8	52.6	-2.3	63.8	-1.7	71.8	+1.4	76.4	-2.7	77.6	-1.3	66.0	+5.0	56.1	+2.2	41.8	-0.3	33.2	-2.3
Cincinnati, Ohio.....	34.0	-7.3	38.7	+2.5	43.8	+1.4	54.5	-1.6	65.3	-1.2	73.4	+1.3	78.2	-1.6	75.0	+0.1	68.4	+5.2	58.6	+2.7	45.2	-0.7	37.3	-1.3
Pittsburg, Pa.....	30.5	-5.6	33.9	+5.5	38.6	+1.6	50.1	-0.5	61.9	+0.5	70.4	+0.3	74.0	-2.4	71.9	-0.2	65.4	+5.0	55.2	+2.9	42.0	+0.7	34.0	+0.3
<b>Lower Lakes:</b>																								
Buffalo, N. Y.....	22.7	-5.7	26.0	+1.3	30.0	-0.7	40.8	-1.1	53.3	-1.2	64.2	+2.3	69.4	-4.5	69.2	-1.7	62.3	+3.3	51.2	+0.8	38.3	-0.4	29.4	+0.4
Oswego, N. Y.....	25.9	-4.0	27.5	+1.7	33.3	-0.3	42.9	-2.0	54.8	-1.5	64.8	+1.0	70.0	-5.5	69.6	-2.2	62.7	+1.7	51.7	-1.7	39.7	-2.3	30.4	+2.9
Erie, Pa.....	27.1	-6.4	29.0	+1.1	33.6	-0.4	44.3	-2.0	57.6	-0.7	67.2	+1.7	71.4	-7.1	70.4	-1.5	63.8	+3.6	53.9	+1.7	41.2	-0.2	32.5	+1.3
Cleveland, Ohio.....	25.8	-6.5	28.7	+0.9	33.6	+0.0	44.7	-1.2	57.9	-0.3	67.0	+1.5	71.3	-2.3	69.7	-1.5	63.7	+3.5	53.7	+2.0	39.0	-0.8	30.4	+0.4
Toledo, Ohio.....	27.4	-7.4	30.9	+1.0	36.0	-0.8	47.9	-2.3	60.3	-0.5	69.3	+1.4	73.9	-2.3	71.5	-1.5	64.4	+4.9	54.2	+2.1	40.8	-0.8	31.8	-1.8
Detroit, Mich.....	24.5	-3.2	28.2	+2.4	33.3	+2.3	45.5	-0.1	53.1	+0.8	67.2	+3.3	71.5	-2.0	70.2	-0.8	63.1	+4.3	52.7	+3.6	39.1	+0.5	30.0	+0.5
<b>Upper Lakes:</b>																								
Alpena, Mich.....	18.2	-5.5	18.9	-2.7	24.1	-0.9	36.9	+0.4	49.0	-0.5	60.4	+3.1	65.7	-4.4	64.6	-2.6	57.3	+3.2	45.9	+2.4	32.7	-1.0	23.9	-0.7
Escanaba, Mich.....	14.6	-6.0	16.5	-6.5	23.0	-1.1	35.9	+0.4	49.8	-0.7	59.3	+2.4	64.6	-4.0	65.0	-4.0	56.8	+3.2	45.3	+2.3	31.9	-1.4	21.9	-2.3
Grand Haven, Mich.....	25.6	-4.7	27.1	-2.3	32.3	-0.2	44.2	-0.5	55.8	-0.7	64.0	+1.0	69.4	-5.7	68.1	-2.4	61.3	+2.4	51.3	+1.5	38.4	-0.1	30.3	-1.9
Marquette, Mich.....	17.3	-6.4	18.7	-2.6	25.0	-2.3	37.3	-2.3	49.8	-2.6	58.6	+1.2	63.7	-6.5	62.0	-2.4	54.8	+3.0	46.1	+1.6	33.2	-0.9	23.6	-2.2
Port Huron, Mich.....	21.6	-6.0	24.2	-2.0	29.4	-0.0	40.8	-1.6	53.3	+0.0	63.0	+0.3	68.3	-6.8	67.0	-3.8	60.8	+4.7	49.9	+1.1	36.8	-1.1	26.8	-0.9
Chicago, Ill.....	24.9	-5.7	29.4	-1.7	35.2	-1.0	45.9	-1.6	57.0	-0.3	66.2	+0.2	73.0	-3.8	71.5	-2.7	64.2	+4.7	53.4	+3.0	39.9	+0.1	29.8	-1.4
Milwaukee, Wis.....	20.0	-6.4	24.9	-2.8	30.8	-1.1	43.5	-1.6	55.0	-0.1	62.0	-0.7	68.5	-4.1	65.8	-2.1	58.6	+2.3	50.1	+1.7	36.9	-0.3	27.8	-2.0
Duluth, Minn.....	11.2	-5.9	16.4	-8.8	25.0	-2.9	33.8	-2.8	43.8	+0.1	57.9	-0.1	64.5	-4.1	65.8	-2.1	54.3	+1.2	45.0	+1.7	32.6	-0.3	17.3	-7.7
<b>Upper Mississippi Valley:</b>																								
Saint Paul, Minn.....	13.9	-6.0	19.4	-6.1	28.9	-0.7	45.4	+1.1	53.5	+0.5	66.4	+3.3	71.0	-2.4	69.8	-0.9	59.5	+1.2	47.6	+4.2	31.1	+0.8	19.2	-4.4
La Crosse, Wis.....	16.8	-5.4	23.5	-5.6	31.8	-2.4	47.7	+1.2	55.0	-0.1	68.3	+1.0	73.3	-3.0	71.0	-2.4	61.9	+4.0	50.7	+3.4	34.5	-0.5	23.3	-6.1
Davenport, Iowa.....	21.9	-3.1	28.2	-1.4	35.0	-0.8	49.8	-1.3	61.6	-0.4	69.3	+1.0	74.7	-3.9	72.6	-3.0	64.4	+4.1	53.5	+3.7	38.2	+2.1	28.1	-6.0
Dubuque, Iowa.....	19.0	-4.9	25.2	-3.0	33.4	-1.2	43.5	-0.1	50.6	-0.6	63.2	+0.4	73.6	-3.6	71.6	-3.2	62.9	+4.0	52.0	+3.1	35.7	+0.6	25.2	-3.9
Keokuk, Iowa.....	25.1	-6.4	31.2	-3.7	38.2	-0.9	52.1	-1.5	63.2	-0.9	71.4	+0.1	77.1	-3.2	74.6	-3.6	65.6	+4.0	55.1	+3.4	39.4	+1.1	28.2	-6.2



Calro, Ill.....	38.0	-8.1	41.6	+ 0.4	47.9	-0.3	58.8	-2.6	67.0	-1.5	76.2	-1.5	72.6	-1.3	77.2	-1.8	60.6	+4.6	60.8	+2.5	47.0	+1.5	39.0	-2.8
Saint Louis, Mo.....	31.9	-6.1	36.4	- 0.9	42.9	+0.7	55.4	-2.0	65.4	-0.9	73.8	-0.5	78.4	-1.1	76.1	-1.7	63.8	+5.1	58.4	+4.4	48.5	+3.6	34.8	-2.0
Missouri Valley.....																								
Leavenworth, Kans.....	26.7	-5.6	33.1	- 5.3	41.4	-0.1	54.0	-3.2	64.6	-2.6	72.9	-0.8	77.5	-0.2	75.7	-3.9	67.2	+4.4	56.2	+3.2	46.7	+2.5	31.4	-7.8
Omaha, Nebr.....	31.1	-4.1	27.1	- 7.7	35.6	-0.8	50.8	-2.8	62.4	- 0.8	70.8	-1.5	73.8	-0.6	74.8	-3.9	53.2	+4.1	54.5	+3.2	41.4	+2.5	26.6	-8.3
Yankton, Dak.....	15.1	-1.6	20.4	- 8.3	23.7	+0.2	45.7	-2.2	55.6	+0.0	63.0	+3.7	72.8	-1.8	71.7	-2.7	61.2	+3.1	49.4	+4.5	31.9	+2.6	20.2	-8.4
Extreme Northwest.....																								
Bismarck, Dak.....	5.8	-1.6	11.4	-11.5	21.7	-2.0	39.9	-1.2	54.9	+0.5	61.8	+5.6	69.2	-4.9	67.8	-2.1	55.8	+0.1	43.1	+3.4	23.5	+3.2	13.1	-8.1
Northern Slope.....																								
Cheyenne, Wyo.....	23.9	-0.8	28.0	- 4.3	33.0	-2.2	40.1	-2.9	50.2	-0.6	60.5	+0.6	66.8	-1.2	64.7	-3.6	55.6	+0.9	44.2	+2.4	32.8	+3.4	27.4	-8.5
North Platte, Nebr.....	20.5	-1.1	26.4	- 6.7	35.6	-1.6	47.0	-2.5	58.4	-0.6	68.3	+2.5	73.5	-0.1	72.0	-3.6	61.7	+3.2	49.4	+3.2	34.5	+3.4	24.7	-8.2
Middle Slope.....																								
Denver, Colo.....	27.2	+3.8	32.6	-2.7	40.0	-1.0	47.1	-2.6	56.4	-2.1	64.5	-1.5	72.4	+1.8	70.2	-2.2	61.5	+3.1	50.5	+5.0	37.1	+5.0	31.2	-6.6
Pike's Peak, Colo.....	24.0	+0.4	4.0	-1.4	7.8	-2.9	13.0	-4.5	21.8	-1.4	32.5	-2.1	38.0	-0.0	38.5	-2.9	32.4	-0.4	21.8	+3.1	10.1	+3.2	6.1	-0.7
Dodge City, Kans.....	26.6	-1.0	31.3	- 4.8	42.1	-0.3	52.8	-2.7	63.0	-3.5	72.9	-1.7	77.3	-0.7	75.0	-3.1	67.2	+3.1	54.8	+3.6	33.8	+2.8	30.2	-9.2
Middle Slope.....																								
Salt Lake City, Utah.....	28.7	+0.4	32.9	-1.6	41.7	-1.1	48.8	-0.8	56.9	+0.8	67.8	+0.9	75.1	-1.7	74.7	-2.1	64.3	-5.5	51.4	+1.2	33.3	+3.8	32.7	+2.8
North Pacific Coast.....																								
Portland, Oreg.....	33.8	-0.1	41.2	-5.2	47.0	-1.6	51.8	+2.2	56.0	+3.8	62.1	+0.6	65.9	-2.4	65.2	+2.8	60.5	-4.8	52.8	-1.6	45.3	+1.5	41.2	-10.2
Middle Pacific Coast.....																								
San Francisco, Cal.....	50.2	-0.2	51.7	- 1.7	53.7	+0.3	54.5	+0.5	56.6	+1.6	58.7	+0.3	58.6	+1.4	58.4	+0.3	59.7	-1.4	58.8	-1.9	53.3	+1.1	51.7	+ 0.8
South Pacific Coast.....																								
San Diego, Cal.....	33.5	+1.5	54.7	+ 1.2	55.9	+0.6	58.0	-0.4	61.2	+0.2	64.7	-0.3	67.2	+1.2	63.8	+0.7	63.7	-1.6	62.8	-1.5	53.1	+0.5	55.7	-1.3
Alaska Stations.....																								
Saint Michael's, Fort, Alaska.....	7.8	-4.7	-0.9	+13.8	9.1	+4.6	19.2	+3.8	22.9	+1.7	46.6	+0.8	53.7	-1.2	53.0		43.9	-3.5	30.8	-7.9	16.3	+0.0	5.1	+3.1

## APPENDIX 12.

*Annual and mean annual temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army.*

[The daily means are obtained by dividing the sum of the three telegraphic observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month; the annual, by dividing the sum of the monthly by 12. From August 25, 1872, to November 1, 1879, observations were taken at 7.35 a. m., 4.35 and 11 p. m., Washington time; and from November 1, 1879, to December 31, 1884, at 7 a. m., 3 and 11 p. m., Washington time.]

Stations.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	No. of years.	Mean annual.
New England:	o	o	o	o	o	o	o	o	o	o	o	o	o	o
Eastport, Me.	41.1	38.6	40.8	42.6	43.0	40.6	42.3	42.1	41.5	40.6	41.5	11	41.3	
Portland, Me.	43.7	44.9	44.1	43.0	43.3	49.1	47.1	48.7	48.4	48.0	46.4	47.6	12	47.0
Mt. Washington, N. H.	25.4	25.8	23.5	25.9	27.8	28.0	25.8	27.6	27.0	25.6	24.3	27.4	12	26.2
Boston, Mass.	48.3	48.7	46.2	47.3	49.2	49.2	47.8	49.4	48.5	48.1	47.6	48.3	12	48.2
Block Island, R. I.									50.3	50.0	48.8	49.7	4	49.6
New Haven, Conn.	47.8	49.2	48.2	50.7	52.4	52.9	50.7	51.6	49.8	48.7	47.5	48.8	12	49.9
New London, Conn.	47.4	49.1	47.3	49.5	51.0	51.3	49.7	50.8	50.3	49.8	48.8	49.7	12	49.6
Middle Atlantic States:														
Albany, N. Y.	46.3	43.6	47.0	48.1	48.7	46.4	50.4	51.4	51.0	49.2	50.0	11	48.4	
New York City.	50.2	51.4	48.6	50.5	52.6	52.9	51.3	52.2	52.2	51.5	50.6	51.6	12	51.2
Philadelphia, Pa.	51.5	52.6	50.1	52.5	53.9	54.6	53.4	54.5	54.2	54.6	53.6	53.5	12	53.2
Atlantic City, N. J.	51.6	49.2	51.1	52.5	53.0	51.5	53.9	52.7	52.6	52.6	51.4	52.6	11	52.0
Barnegat City, N. J.	51.0	48.8	51.0	52.1	52.4	50.7	52.4	51.6	52.0	52.0	51.6	52.6	11	51.5
Cape May, N. J.	51.7	52.2	50.2	53.6	54.8	56.0	54.2	55.6	54.7	55.2	53.8	54.3	12	53.9
Sandy Hook, N. J.	49.8	49.1	51.9	53.3	53.4	51.6	53.5	53.3	52.7	51.6	52.2	11	52.0	
Del. Breakwater, Del.									54.4	54.0	53.3	54.1	4	54.0
Baltimore, Md.	54.3	55.5	53.1	54.9	56.3	56.9	55.0	56.4	57.1	55.7	55.1	56.2	12	55.6
Washington City.	54.3	55.9	52.2	54.4	55.5	56.0	55.1	55.6	55.9	54.9	54.0	53.1	12	55.0
Cape Henry, Va.	59.1	57.6	58.4	58.3	59.6	58.8	60.6	59.5	58.9	58.3	58.7	11	58.9	
Chincoteague, Va.									54.7	55.2	54.6	55.6	4	55.0
Lynchburg, Va.	55.0	56.6	55.8	57.1	59.2	58.7	58.4	58.2	59.8	57.7	57.5	57.6	12	57.6
Norfolk, Va.	58.1	58.7	57.6	59.0	58.9	59.3	59.2	60.5	59.9	59.8	59.9	60.4	12	59.3
South Atlantic States:														
Charlotte, N. C.							60.4	60.8	61.4	60.4	60.5	60.5	6	60.6
Hatteras, N. C.									61.9	61.7	61.2	62.2	4	61.8
Kitty Hawk, N. C.				59.3	59.3	60.1	59.3	61.3	59.7	59.5	59.5	60.4	9	59.8
Macon, Fort. N. C.									62.4	62.4	61.9	62.7	4	62.4
Smithville, N. C.				63.1	63.2	63.7	63.1	65.0	63.4	63.2	63.1	63.8	9	63.5
Wilmington, N. C.	63.0	63.6	61.5	61.6	62.4	62.2	62.6	63.6	64.2	64.2	64.0	64.5	12	63.1
Charleston, S. C.	64.6	65.7	64.8	65.5	66.1	66.5	66.7	67.2	66.8	67.1	66.6	66.7	12	66.2
Augusta, Ga.	62.9	64.4	63.3	63.4	64.3	65.2	65.2	65.4	65.7	65.3	65.8	65.2	12	64.7
Savannah, Ga.	65.0	66.5	65.8	66.6	67.0	67.8	67.4	68.0	67.8	68.1	68.3	67.1	12	67.1
Jacksonville, Fla.	63.2	69.8	68.8	68.4	69.1	69.3	69.3	70.2	70.2	70.4	70.6	69.6	12	69.5
Florida Peninsula:														
Cedar Key, Fla.								70.9	70.5	71.1	72.4	70.7	5	71.1
Key West, Fla.	77.0	77.8	78.1	77.0	77.0	77.1	77.1	78.7	78.1	78.2	78.4	77.6	12	77.7
Eastern Gulf States:														
Atlanta, Ga.							61.5	62.1	62.0	61.8	61.5	61.1	6	61.7
Pensacola, Fla.								63.3	63.3	63.4	69.0	67.8	5	68.4
Mobile, Ala.	66.0	67.9	66.7	68.0	68.8	67.3	67.0	(1)	68.0	68.2	68.9	66.7	11	67.2
Montgomery, Ala.	64.2	66.1	65.2	64.6	65.3	65.8	65.6	65.8	66.1	66.0	66.7	65.4	12	65.6
Vicksburg, Miss.	65.3	66.0	64.0	64.3	64.9	66.0	66.3	65.2	66.8	66.9	66.4	65.5	12	65.7
New Orleans, La.	63.0	69.9	68.8	68.4	68.3	68.9	69.8	69.4	69.7	70.8	71.1	69.8	12	69.4
Western Gulf States:														
Shreveport, La.	64.5	68.0	63.2	64.7	64.8	65.6	66.9	65.6	66.4	66.2	65.8	65.1	12	65.7
Fort Smith, Ark.											59.7	59.3	2	59.5
Little Rock, Ark.								61.9	63.0	62.9	62.1	61.4	5	62.3
Galveston, Tex.	63.3	70.5	69.8	70.1	69.0	70.0	70.8	69.8	70.1	71.5	70.6	70.3	12	70.2
Indianola, Tex.	60.6	70.6	69.4	69.7	69.4	70.7	71.1	69.5	70.1	71.8	70.3	69.4	12	70.1
Palcatine, Tex.											65.7	64.4	2	65.0
Rio Grande Valley:														
Brownsville, Tex.						72.7	73.7	72.6	72.5	73.8	72.7	71.6	7	72.8
Rio Grande City, Tex.								74.2	72.8	73.1	(1)	73.5	4	73.4
Ohio Valley and Tennessee:														
Chattanooga, Tenn.							60.7	60.3	60.8	60.4	60.8	59.6	6	60.4

<sup>1</sup> Record incomplete.

<sup>2</sup> No record.

*Annual and mean annual temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army—Continued.*

Stations.	1872.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	No. of years.	Mean annual.	
<b>Ohio Valley and Tennessee—Continued:</b>															
Knoxville, Tenn.	56.5	57.8	55.5	55.7	57.0	57.6	58.8	58.5	58.7	58.2	57.9	57.5	12	57.5	
Memphis, Tenn.	59.6	62.4	59.4	60.1	60.9	61.9	61.6	61.0	62.5	62.5	61.4	61.1	12	61.2	
Nashville, Tenn.	59.1	61.5	58.4	58.9	59.5	60.0	60.5	60.2	61.2	60.8	59.1	58.7	12	59.8	
Louisville, Ky.	55.7	57.8	54.5	56.2	57.5	57.8	57.2	57.4	58.2	57.9	56.4	57.1	12	57.0	
Indianapolis, Ind.	51.9	54.6	50.2	52.9	54.3	55.0	53.8	53.9	54.7	53.5	51.8	52.5	12	53.3	
Cincinnati, Ohio.	55.0	57.0	53.0	55.2	56.2	57.0	56.2	56.8	57.7	56.9	55.3	56.0	12	56.0	
Columbus, Ohio.							52.3	53.5	53.7	52.7	51.1	52.2	6	52.7	
Pittsburg, Pa.	50.4	51.7	48.8	51.5	52.8	52.8	52.1	53.4	54.0	52.8	51.9	52.2	12	52.1	
<b>Lower Lakes:</b>															
Buffalo, N. Y.	46.0	46.2	42.7	45.8	47.8	48.8	46.4	47.5	47.3	47.0	44.9	45.8	12	46.4	
Oswego, N. Y.	46.3	46.9	44.2	47.2	49.0	51.2	48.8	49.1	48.2	47.9	45.5	46.1	12	47.5	
Rochester, N. Y.	45.1	46.7	43.9	46.8	48.6	49.6	47.4	48.7	48.6	48.7	(1)	46.0	11	47.1	
Erie, Pa.		50.1	46.4	49.0	50.3	51.8	49.7	50.4	50.0	49.5	47.5	48.8	11	49.4	
Cleveland, Ohio.	48.6	50.5	45.9	48.0	50.0	50.5	49.1	50.0	49.8	49.4	47.3	48.4	12	49.0	
Sandusky, Ohio.						52.0	50.8	51.4	51.3	50.7	(1)	49.9	6	51.0	
Toledo, Ohio.	49.3	49.8	46.7	50.2	52.1	52.8	51.2	51.9	51.8	51.5	48.9	49.9	12	50.5	
Detroit, Mich.	46.2	48.2	44.1	47.2	49.0	49.6	48.0	48.7	51.2	51.2	47.7	49.7	12	48.4	
<b>Upper Lakes:</b>															
Alpena, Mich.	39.7	41.2	37.2	40.9	43.3	45.0	41.3	42.2	42.1	42.7	38.7	40.4	12	41.2	
Escanaba, Mich.	39.2	40.4	36.1	39.8	42.5	44.6	40.9	41.8	41.1	42.8	37.0	39.2	12	40.5	
Grand Haven, Mich.	45.2	47.5	43.3	46.9	48.9	50.1	47.8	48.8	48.1	48.2	44.7	46.9	12	47.2	
Mackinaw City, Mich.											39.3	40.7	2	40.0	
Marquette, Mich.	39.2	41.2	37.0	40.8	44.4	46.5	42.5	42.0	41.0	42.3	38.1	39.0	12	41.2	
Fort Huron, Mich.				41.7	44.9	46.3	47.9	45.3	45.8	45.3	42.7	44.4	10	45.2	
Chicago, Ill.	47.2	50.4	45.4	49.0	50.3	51.4	49.9	50.6	49.4	49.6	46.3	48.2	12	49.0	
Milwaukee, Wis.	43.9	45.0	40.8	43.9	45.8	48.5	46.2	46.7	46.3	47.1	43.4	43.9	12	45.1	
Omaha, Minn.	39.3	39.8	36.3	37.9	43.5	45.3	40.0	38.7	40.4	41.2	38.0	37.3	12	39.8	
<b>Upper Mississippi Valley:</b>															
Saint Paul, Minn.	41.6	43.8	39.8	42.8	47.5	48.2	45.5	44.0	45.2	45.6	40.9	43.7	12	44.0	
La Crosse, Wis.	43.5	47.5	43.1	45.5	48.8	50.9	47.6	46.9	48.0	48.7	43.9	45.5	12	46.7	
Davenport, Iowa.	49.0	49.6	45.4	48.8	50.8	52.2	50.0	51.0	50.4	51.7	48.3	49.8	12	49.8	
Des Moines, Iowa.							49.7	49.9	49.7	46.1	47.5	6	48.7		
Dubuque, Iowa.		48.9	44.8	47.6	49.6	50.6	48.5	48.6	49.0	49.0	45.5	47.1	11	48.1	
Keokuk, Iowa.	50.5	52.6	48.5	51.0	52.9	55.0	52.9	53.5	52.6	52.6	49.6	50.7	12	51.9	
Cairo, Ill.	56.8	58.4	55.7	57.1	58.5	60.1	59.6	59.0	59.6	59.2	57.4	57.4	12	58.2	
Springfield, Ill.								54.1	53.8	53.9	51.0	52.3	5	53.0	
Saint Louis, Mo.	53.7	56.3	53.9	55.4	56.4	57.4	55.7	55.1	55.9	55.6	53.6	55.3	12	55.4	
<b>Missouri Valley:</b>															
Leavenworth, Kans.	54.7	54.2	51.0	53.2	53.8	55.4	54.5	54.1	54.1	54.7	51.7	51.9	12	53.4	
Omaha, Nebr.	48.6	50.0	46.3	48.6	50.9	52.5	51.5	50.3	49.7	51.4	47.8	48.4	12	49.7	
Bennett, Fort, Dak.									43.8	45.7	42.2	42.5	4	43.6	
Huron, Dak.										43.8	40.7	40.8	3	41.8	
Yankton, Dak.		46.7	41.2	43.5	46.7	48.2	47.3	46.5	45.4	47.4	44.0	44.6	11	45.6	
<b>Extreme Northwest:</b>															
Moorhead, Minn.										37.9	38.6	34.0	35.9	4	36.6
Saint Vincent, Minn.										35.5	34.4	30.3	32.5	4	33.2
Blamack, Dak.			35.0	36.8	42.4	44.8	39.5	38.4	40.1	41.1	37.7	37.8	10	39.4	
Buford, Fort, Dak.							39.0	36.6	39.4	41.0	36.2	37.4	6	38.3	
<b>Northern Slope:</b>															
Assinaboine, Ft. Mont.										42.7	39.2	39.1	3	40.3	
Bentou, Fort, Mont.	42.5	43.3	42.1	(1)	(2)	(2)	(2)	40.3	43.6	44.8	43.0	41.5	8	42.6	
Custer, Fort, Mont.								43.0	45.3	45.2	(1)	40.9	4	43.6	
Helena, Mont.									43.8	43.8	42.7	40.2	4	42.6	
Maginnis, Fort, Mont.											39.5	38.1	2	38.8	
Shaw, Fort, Mont.									42.1	42.5	40.6	39.8	4	41.2	
Deadwood, Dak.								40.8	(1)	42.9	40.5	40.5	4	41.2	
Cheyenne, Wyo.	44.8	45.5	42.5	44.3	44.2	44.2	46.5	42.9	45.8	43.9	42.4	42.6	12	44.1	
North Platte, Nebr.			46.3	47.5	48.2	49.7	48.1	47.1	47.9	49.1	45.9	46.8	10	47.7	
<b>Middle Slope:</b>															
Denver, Colo.	48.1	49.8	48.6	49.5	48.8	49.5	50.8	47.4	50.8	50.3	48.8	49.5	12	49.8	
Pike's Peak, Colo.		18.9	18.2	19.0	18.4	19.4	21.9	17.9	20.7	18.8	18.7	18.3	11	19.1	
West Las Animas, Colo.											49.6	48.2	2	49.2	
Dodge City, Kans.			52.4	53.2	53.2	54.4	54.3	52.0	53.0	53.6	51.0	51.2	10	52.8	
Elliott, Fort, Tex.								54.4	54.9	54.8	54.8	54.5	5	54.6	
<b>Southern Slope:</b>															
Sill, Fort, Ind. T.					59.5	61.6	62.0	59.4	61.2	60.0	(1)	(1)	6	60.6	
Concho, Fort, Tex.						63.7	60.3	62.3	63.9	63.5	63.3	62.5	7	63.6	
Davis, Fort, Tex.							62.0	58.0	(1)	59.3	59.9	59.6	5	59.8	
Stockton, Fort, Tex.						62.9	65.7	61.3	62.7	61.5	62.3	63.1	7	62.8	
<b>Southern Plateau:</b>															
Santa Fe, N. Mex.	48.6	48.0	48.0	47.5	47.6	47.5	50.2	48.4	(1)	48.3	(1)	(1)	9	47.9	
El Paso, Tex.							56.3	53.0	62.9	61.6	62.6	62.5	6	63.2	
Apache, Fort, Ariz.							53.4	50.8	52.4	51.3	52.2	51.9	6	52.0	

<sup>1</sup> Record incomplete.

<sup>2</sup> No record.

*Annual and mean annual temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army—Continued.*

Stations.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	No. of years.	Mean annual.
Southern Plateau—Cont'd.	°	°	°	°	°	°	°	°	°	°	°	°		
Grant, Fort, Ariz.....	.....	.....	.....	.....	.....	.....	63.2	59.1	59.8	58.6	59.0	60.0	6	60.0
Prescott, Ariz.....	.....	.....	.....	.....	.....	52.3	54.7	50.6	52.5	51.1	52.5	50.8	7	52.1
Thomas, Camp, Ariz.....	.....	.....	.....	.....	.....	.....	.....	.....	60.7	61.3	61.9	61.6	4	61.4
Yuma, Ariz.....	.....	.....	.....	74.0	73.7	72.0	73.3	70.2	71.9	70.8	( <sup>1</sup> )	70.4	8	72.0
Middle Plateau:														
Winnemucca, Nev.....	.....	.....	.....	.....	.....	49.8	50.0	( <sup>1</sup> )	49.2	46.8	( <sup>1</sup> )	( <sup>1</sup> )	4	49.6
Salt Lake City, Utah.....	.....	.....	52.4	51.2	51.4	51.9	53.0	48.6	51.8	49.2	50.8	50.9	10	51.1
Northern Plateau:														
Boisé City, Idaho.....	.....	.....	.....	.....	.....	52.4	51.4	48.9	50.0	48.6	( <sup>1</sup> )	50.0	6	50.2
Lewiston, Idaho.....	.....	.....	.....	.....	.....	.....	.....	49.5	51.1	51.6	50.8	49.4	5	50.4
Dayton, Wash.....	.....	.....	.....	.....	.....	.....	.....	47.9	49.3	48.6	48.1	47.2	5	48.2
Spokane Falls, Wash.....	.....	.....	.....	.....	.....	.....	.....	.....	46.5	46.8	45.4	3	46.2	
North Pacific Coast:														
Olympia, Wash.....	.....	.....	.....	.....	.....	50.8	49.0	47.7	49.7	48.9	49.0	49.4	7	49.2
Portland, Oreg.....	52.6	53.6	53.8	53.1	53.9	53.3	52.4	50.4	52.2	51.5	51.7	51.1	12	52.4
Roseburg, Oreg.....	.....	.....	.....	.....	.....	53.1	52.2	50.6	52.2	51.5	51.8	( <sup>1</sup> )	6	51.9
Middle Pacific Coast:														
Cape Mendocino, Cal.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	50.6	51.8	2	51.2	
Red Bluff, Cal.....	.....	.....	.....	.....	.....	64.0	64.2	61.8	62.1	( <sup>1</sup> )	61.5	60.8	6	62.4
Sacramento, Cal.....	.....	.....	.....	.....	.....	61.3	60.3	57.2	59.2	58.5	58.8	58.8	7	59.2
San Francisco, Cal.....	55.9	55.7	55.6	56.3	57.3	56.5	56.1	54.2	55.8	54.4	54.7	55.8	12	55.7
South Pacific Coast:														
Los Angeles, Cal.....	.....	.....	.....	.....	.....	60.7	60.6	58.4	61.1	60.1	61.6	60.8	7	60.5
San Diego, Cal.....	60.6	59.6	61.6	61.0	62.1	60.6	60.1	58.5	60.4	59.8	61.2	60.7	12	60.5
Alaska Stations:														
Saint Michael's, Fort, Alaska.....	.....	.....	26.2	24.3	25.2	25.6	26.4	23.2	28.3	26.1	23.2	27.8	10	26.1
Sitka, Alaska.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	43.2	44.3	44.2	3	43.9
Behring's Island, Behring Sea.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	35.5	35.9	2	35.7

<sup>1</sup> Record incomplete.

<sup>2</sup> No record.

## APPENDIX 13.

*Mean daily range of temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army, for each month of the year 1884. The daily range is the difference between the highest and lowest temperature, as recorded by self-registering thermometers.*

[The mean daily is obtained by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
<b>New England:</b>	°	°	°	°	°	°	°	°	°	°	°	°
Eastport, Me. ....	14.9	14.8	12.3	10.4	14.0	17.9	14.1	15.1	13.9	12.5	13.0	14.0
Portland, Me. ....	16.1	15.4	15.5	14.2	15.8	18.3	15.9	14.5	16.5	15.8	14.0	13.8
Mount Washington, N. H. ....	19.6	21.4	17.4	12.5	12.5	18.3	10.8	12.4	12.0	15.2	16.0	16.9
Boston, Mass. ....	15.7	16.0	16.0	14.1	18.7	21.3	17.3	15.8	19.5	17.7	17.5	15.1
Block Island, R. I. ....	13.9	14.6	12.4	10.9	12.9	13.3	10.9	9.4	11.8	12.2	14.4	12.7
New Haven, Conn. ....	16.8	14.5	15.7	16.9	18.6	23.8	16.0	16.4	20.2	18.7	18.5	16.0
New London, Conn. ....	13.8	14.8	14.0	15.3	18.5	19.2	13.8	13.5	16.2	15.9	16.8	13.6
<b>Middle Atlantic States:</b>												
Albany, N. Y. ....	16.3	13.3	11.5	13.9	16.1	20.0	15.6	16.9	16.5	17.8	14.9	14.7
New York City. ....	13.2	14.5	13.3	16.0	16.7	18.8	15.6	14.6	17.3	16.6	15.2	13.2
Philadelphia, Pa. ....	13.4	14.7	12.9	16.5	17.9	21.5	17.0	16.2	19.2	18.7	17.0	13.0
Atlantic City, N. J. ....	14.1	11.9	12.6	14.2	15.2	12.6	14.1	11.4	12.7	15.0	17.3	12.9
Barnegat City, N. J. ....	14.0	12.5	(*)	13.1	14.9	13.9	14.5	11.5	13.9	15.9	17.2	14.8
Cape May, N. J. ....	18.6	12.7	11.5	12.8	13.2	13.7	11.3	10.8	11.5	13.8	15.0	12.9
Sandy Hook, N. J. ....	12.4	12.7	11.8	12.8	14.8	14.2	12.6	11.3	16.1	15.5	14.0	13.7
Delaware Break- water, Del. ....	12.4	13.9	12.4	10.9	13.0	12.0	11.9	9.3	13.4	13.2	13.4	11.4
Baltimore, Md. ....	13.9	13.8	12.8	14.7	15.9	17.4	15.8	14.5	17.9	16.9	16.0	12.5
Washington City. ....	14.6	16.3	14.9	18.1	20.6	21.4	18.7	18.3	21.7	20.0	19.8	13.6
Cape Henry, Va. ....	16.1	16.7	15.8	14.5	15.4	14.6	13.8	12.0	14.6	14.5	15.4	14.8
Chincoteague, Va. ....	14.0	12.9	13.6	13.9	16.5	16.3	14.0	11.6	15.2	16.0	16.0	13.9
Lynchburg, Va. ....	15.7	17.3	17.3	17.8	19.6	18.3	19.1	19.0	21.3	21.4	20.7	15.5
Norfolk, Va. ....	16.4	18.0	16.0	14.9	18.1	17.2	15.0	12.1	15.3	16.5	15.8	14.3
<b>South Atlantic States:</b>												
Charlotte, N. C. ....	16.3	13.1	17.4	19.0	13.6	15.9	13.2	13.1	17.5	19.8	19.2	16.6
Hatteras, N. C. ....	15.6	15.2	13.6	11.8	11.8	10.7	9.6	8.1	10.4	10.7	11.5	13.2
Kitty Hawk, N. C. ....	14.5	17.5	15.8	12.4	16.2	13.1	13.9	9.7	11.8	13.9	12.6	14.0
Macon, Fort, N. C. ....	14.8	14.1	12.3	13.0	10.6	10.8	9.1	8.6	9.8	11.7	13.8	14.3
Smithville, N. C. ....	16.7	14.2	13.0	15.0	13.3	13.9	11.6	11.7	12.3	15.1	18.1	16.0
Wilmington, N. C. ....	17.9	13.9	14.6	17.5	16.8	15.9	14.1	14.0	16.4	18.1	19.5	13.2
Charleston, S. C. ....	16.3	15.0	14.0	14.6	13.2	11.9	13.0	12.6	11.6	12.6	15.4	14.0
Augusta, Ga. ....	17.7	21.6	18.3	19.3	19.0	15.1	17.0	17.4	17.1	20.4	23.8	18.5
Savannah, Ga. ....	16.9	16.9	15.1	16.0	15.8	13.0	13.8	13.8	12.6	14.9	17.7	17.0
Jacksonville, Fla. ....	13.0	17.3	16.5	16.5	15.9	14.3	14.7	15.7	14.1	15.1	16.4	14.5
<b>Florida Peninsula:</b>												
Cedar Key, Fla. ....	15.2	12.5	12.2	12.3	12.3	13.4	11.0	13.8	13.4	14.9	14.9	11.5
Key West, Fla. ....	9.2	9.2	10.6	10.4	12.2	12.0	11.9	12.7	10.3	7.2	6.0	7.7
Sanford, Fla. ....	19.9	18.6	18.9	20.2	21.0	18.4	18.7	17.8	17.2	18.3	20.1	20.2
<b>Eastern Gulf States:</b>												
Atlanta, Ga. ....	13.1	17.2	15.8	16.3	16.8	14.2	14.2	15.6	17.6	18.1	18.6	15.3
Pensacola, Fla. ....	19.0	16.7	13.8	14.6	13.8	13.1	12.7	14.9	13.0	14.7	19.2	15.1
Mobile, Ala. ....	18.4	16.5	16.6	18.0	13.7	13.9	16.1	17.7	16.5	18.9	22.5	17.6
Montgomery, Ala. ....	13.4	19.7	18.1	13.8	19.9	17.0	13.1	19.4	20.9	21.7	24.0	13.7
Vicksburg, Miss. ....	17.9	18.6	16.1	13.8	13.4	13.9	19.1	20.8	19.6	19.2	21.3	17.9
New Orleans, La. ....	13.3	16.2	14.1	13.5	12.5	11.8	12.8	13.7	13.0	13.1	14.5	13.7
<b>Western Gulf States:</b>												
Shreveport, La. ....	13.2	13.6	20.0	20.8	13.6	21.2	21.9	21.7	20.8	20.4	22.3	19.0
Fort Smith, Ark. ....	22.0	20.2	22.1	21.2	22.3	22.6	24.6	22.1	22.9	24.3	22.6	17.1
Little Rock, Ark. ....	16.7	13.3	17.5	17.6	13.0	13.1	20.3	20.4	19.0	18.5	19.7	14.9
Galveston, Tex. ....	13.3	11.9	10.7	10.3	10.6	10.8	10.1	10.3	8.8	10.0	11.4	14.5
Indianola, Tex. ....	17.3	15.5	13.4	13.3	13.7	12.9	13.5	12.6	10.2	10.8	11.0	16.9
Falstein, Tex. ....	13.4	19.9	13.3	13.3	17.5	13.8	19.6	21.1	19.5	18.2	19.5	20.3
<b>Rio Grande Valley:</b>												
Brownsville, Tex. ....	19.6	13.9	17.6	13.6	17.2	17.0	15.1	17.7	15.1	14.5	16.1	17.8
Rio Grande City, Tex. ....	25.3	24.7	23.2	23.8	23.1	25.9	27.9	25.9	20.3	17.1	16.4	13.5

°90 days.

°20 days.

°No record.

°25 days.

°23 days.

°27 days.

*Mean daily range of temperature at stations of the Signal Service, &c.—Continued.*

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
<b>Ohio Valley and Tennessee:</b>												
Chattanooga, Tenn.	17.5	15.7	17.0	17.5	19.4	18.0	17.0	17.9	19.0	19.3	21.0	17.3
Knoxville, Tenn.	13.5	16.9	18.8	19.4	21.0	18.7	18.3	20.3	22.0	23.4	23.1	17.6
Memphis, Tenn.	16.3	17.5	18.0	16.2	17.2	15.3	16.8	16.6	17.1	17.6	19.6	15.9
Nashville, Tenn.	18.0	16.9	15.8	17.3	17.7	15.4	17.1	19.5	19.6	20.0	22.0	18.3
Louisville, Ky.	16.6	17.7	14.3	15.1	17.4	15.4	16.3	18.2	16.6	17.7	17.2	15.3
Indianapolis, Ind.	15.3	16.7	15.1	15.9	17.2	16.5	17.1	18.5	17.0	16.6	16.8	14.5
Cincinnati, Ohio.	15.1	16.2	12.7	13.8	14.4	14.2	13.9	15.4	14.7	15.9	16.8	15.7
Columbus, Ohio.	15.5	15.4	14.4	17.7	18.4	19.5	18.0	19.9	19.3	17.8	17.6	16.2
Pittsburg, Pa.	17.5	20.0	18.6	18.8	22.9	24.0	23.0	23.2	23.0	22.3	19.3	17.3
<b>Lower Lakes:</b>												
Buffalo, N. Y.	14.6	17.8	14.4	15.2	16.0	17.4	13.1	15.4	14.2	14.6	13.1	11.7
Oswego, N. Y.	15.6	16.1	12.6	12.0	18.8	19.4	15.1	18.2	18.8	18.9	15.6	14.1
Rochester, N. Y.	14.5	17.0	13.8	14.3	18.1	20.1	15.5	19.2	20.5	18.0	16.7	15.8
Erie, Pa.	15.5	17.8	(*)	15.0	18.5	17.6	14.0	16.2	15.0	15.0	14.3	12.0
Cleveland, Ohio.	16.5	16.7	14.9	15.1	17.2	17.1	14.1	17.1	16.9	17.4	15.9	14.6
Sandusky, Ohio.	14.0	14.6	12.8	12.8	17.5	15.2	15.4	15.0	14.8	14.3	12.7	13.8
Toledo, Ohio.	16.7	14.2	14.7	15.1	17.7	16.4	16.2	17.1	16.5	17.5	16.7	13.8
Detroit, Mich.	14.8	16.1	14.9	18.1	18.8	20.2	18.8	18.2	16.4	17.8	14.3	13.5
<b>Upper Lakes:</b>												
Alpena, Mich.	15.3	15.4	17.5	14.9	17.1	18.0	17.9	17.1	19.0	16.6	12.6	13.0
Escanaba, Mich.	13.6	19.4	22.7	16.5	16.5	13.2	17.6	15.8	14.2	15.2	15.1	12.9
Grand Haven, Mich.	15.2	14.3	15.0	15.2	14.8	16.2	13.5	13.5	14.4	13.3	14.0	11.6
MacKinnaw City, Mich.	16.7	17.9	19.0	15.3	15.0	16.9	14.7	15.8	16.3	13.7	11.6	10.6
Marquette, Mich.	20.5	23.2	22.9	17.6	16.9	23.0	16.4	19.1	17.7	18.6	15.6	14.6
Port Huron, Mich.	16.0	15.5	14.5	13.7	17.8	19.0	17.5	13.6	18.8	17.6	14.6	13.4
Chicago, Ill.	15.4	15.1	12.8	12.8	15.6	13.8	13.8	13.2	13.5	15.6	15.6	15.6
Milwaukee, Wis.	15.9	16.3	13.9	12.4	17.5	16.3	15.4	14.9	14.7	15.8	15.5	14.3
Duluth, Minn.	21.6	17.6	18.7	10.4	17.5	14.9	14.1	13.3	12.4	14.4	13.7	14.3
<b>Upper Mississippi Valley:</b>												
Saint Paul, Minn.	23.8	22.8	19.2	18.4	21.0	20.1	20.3	19.9	18.4	18.0	17.4	15.7
La Crosse, Wis.	18.0	17.3	15.3	16.3	15.4	15.6	14.3	15.6	15.4	14.7	15.6	12.8
Davenport, Iowa.	22.0	22.5	21.9	23.0	21.7	21.0	21.0	21.8	18.0	15.9	17.2	14.0
Des Moines, Iowa.	20.4	20.0	17.2	18.6	21.3	19.9	20.3	18.7	19.3	19.0	19.4	13.8
Dubuque, Iowa.	18.5	16.6	16.8	21.5	21.3	21.2	22.1	21.2	19.3	17.3	18.5	15.4
Keokuk, Iowa.	16.9	16.9	16.2	17.7	19.5	18.4	18.8	20.1	18.4	18.6	17.8	13.1
Cairo, Ill.	16.2	15.6	13.5	14.4	15.1	13.5	15.0	16.2	15.2	16.8	16.5	13.4
Springfield, Ill.	16.8	16.3	15.6	15.9	18.3	17.4	16.4	17.0	17.9	18.7	17.4	14.5
Saint Louis, Mo.	17.8	18.7	15.1	16.1	17.0	15.5	15.4	15.9	15.0	16.6	18.3	15.0
<b>Missouri Valley:</b>												
Leavenworth, Kans.	17.7	18.3	18.6	18.1	19.8	19.5	20.1	17.2	18.9	21.3	19.6	13.9
Omaha, Nebr.	20.8	21.6	19.6	17.3	20.2	20.1	20.6	17.5	18.5	20.5	21.1	15.8
Bennett, Fort, Dak.	26.6	23.4	22.4	22.8	26.7	26.0	24.1	27.4	28.9	28.1	31.0	20.2
Huron, Dak.	26.5	25.0	21.0	20.2	24.6	24.1	22.3	24.2	25.0	24.6	25.8	18.0
Yankton, Dak.	22.6	20.7	18.4	17.0	21.2	21.9	19.6	19.7	23.3	22.3	22.8	15.3
<b>Extreme Northwest:</b>												
Moorhead, Minn.	25.1	22.9	22.5	18.6	24.4	24.4	22.3	22.6	20.2	20.9	18.8	15.6
Saint Vincent, Minn.	24.7	22.5	23.6	19.2	27.2	25.1	22.4	23.5	21.9	21.1	19.2	19.6
Bismarck, Dak.	22.1	18.7	19.4	17.4	23.1	26.4	22.0	22.8	20.2	23.2	22.6	15.1
Buford, Fort, Dak.	23.7	25.6	21.2	23.1	28.8	29.8	26.3	31.4	24.3	27.5	23.3	17.5
Totten, Fort, Dak.	-----	-----	-----	-----	-----	25.5	24.1	24.8	23.2	23.6	20.7	10.7
<b>Northern Slope:</b>												
Assinaboine, Fort, Mont.	20.2	18.4	25.2	24.6	28.3	24.2	34.0	29.3	20.8	25.6	24.4	19.1
Benton, Fort, Mont.	20.4	21.4	18.8	25.6	33.5	29.5	38.2	34.4	26.0	27.8	28.7	21.2
Custer, Fort, Mont.	23.8	19.7	20.9	26.0	28.9	28.9	29.9	32.6	26.0	29.9	27.8	18.7
Helena, Mont.	14.7	15.0	15.0	17.8	21.6	20.1	20.5	22.7	16.5	19.0	16.2	14.0
Maginnis, Fort, Mont.	17.1	18.2	15.7	18.8	22.8	21.4	21.9	22.6	19.2	23.7	20.4	13.6
Poplar River, Mont.	22.7	19.6	(*)	20.7	28.4	28.1	23.5	32.5	25.3	30.3	26.5	19.0
Shaw, Fort, Mont.	18.6	19.1	21.3	23.0	28.5	25.1	25.0	30.1	22.2	24.2	23.6	17.2
Deadwood, Dak.	19.5	20.1	16.1	14.2	18.8	18.9	19.8	19.1	18.4	30.6	18.9	17.7
Cheyenne, Wyo.	21.1	20.0	20.6	22.5	26.1	29.1	29.5	26.0	30.0	29.5	25.4	26.4
North Platte, Nebr.	23.8	22.1	19.6	18.6	20.7	21.7	21.6	20.7	23.6	25.0	26.5	18.0
<b>Middle Slope:</b>												
Denver, Colo.	23.5	21.4	20.6	21.1	22.5	24.3	23.3	23.8	26.8	26.7	26.4	23.9
Pike's Peak, Colo.	12.4	12.0	11.4	11.4	12.0	10.7	13.8	11.3	18.6	11.6	10.3	10.3
West Las Animas, Colo.	32.6	29.7	32.1	29.2	29.1	28.8	32.1	29.2	34.0	33.2	34.6	26.5
Dodge City, Kans.	26.0	22.8	25.7	25.5	33.1	21.5	22.1	19.9	23.6	22.2	24.1	17.0
Elliott, Fort, Tex.	24.8	23.3	27.4	27.6	24.6	22.5	25.9	21.8	25.5	21.3	25.2	19.5
<b>Southern Slope:</b>												
Concho, Fort, Tex.	23.4	26.4	29.8	28.7	25.7	27.0	29.3	27.2	23.3	22.5	22.3	24.7

<sup>1</sup> Record incomplete.  
<sup>2</sup> 27 days.

<sup>3</sup> Made a station of the second order June 9, 1884.  
<sup>4</sup> 28 days.

<sup>5</sup> 29 days.  
<sup>6</sup> 26 days.

<sup>7</sup> 23 days.  
<sup>8</sup> 25 days.

*Mean daily range of temperature at stations of the Signal Service, &c.—Continued.*

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
<b>Southern Slope—Cont'd.</b>	°	°	°	°	°	°	°	°	°	°	°	°
Davis, Fort, Tex. ....	25.9	27.8	25.8	25.7	29.9	27.0	27.8	25.6	23.4	22.2	25.6	25.6
Stockton, Fort, Tex. ....	27.6	27.8	29.1	29.8	29.2	26.8	29.3	25.1	21.9	21.0	21.0	24.9
<b>Southern Plateau:</b>												
El Paso, Tex. ....	29.3	24.9	29.1	32.4	36.4	35.8	32.6	28.9	26.0	22.0	28.5	24.5
Apache, Fort, Ariz. ....	30.1	24.6	25.0	32.0	35.8	40.0	38.7	31.1	34.3	28.6	35.8	25.4
Grant, Fort, Tex. ....	19.7	16.2	18.3	20.7	20.9	22.8	22.3	22.6	22.1	18.3	22.0	20.2
Prescott, Ariz. ....	24.7	20.9	20.2	24.1	27.5	32.8	31.1	28.0	29.4	27.2	33.0	22.4
Thomas, Camp, Ariz. ....	26.9	24.0	25.8	31.2	35.0	38.3	33.0	28.6	32.2	25.8	31.5	24.8
Yuma, Ariz. ....	21.9	18.3	21.4	28.8	29.5	30.5	29.4	20.4	26.9	26.0	26.2	19.8
<b>Middle Plateau:</b>												
Salt Lake City, Utah. ....	15.2	16.5	15.5	17.4	19.5	22.6	25.6	23.3	21.6	19.2	18.7	13.0
<b>Northern Plateau:</b>												
Boise City, Idaho. ....	26.6	17.5	16.0	19.5	22.5	22.3	25.2	27.1	19.7	20.7	19.1	16.1
Lewiston, Idaho. ....	13.3	16.3	19.0	24.6	30.4	23.5	25.3	32.5	22.3	19.4	16.2	18.3
Dayton, Wash. ....	13.9	18.8	18.9	24.8	29.8	28.7	28.8	35.3	24.4	21.8	15.8	16.4
Spokane Falls, Wash. ....	15.1	17.4	18.6	23.2	28.5	24.8	25.0	31.1	20.4	19.2	13.8	15.0
<b>North Pacific Coast:</b>												
Canby, Fort, Wash. ....	8.4	11.5	10.2	11.0	11.0	9.5	10.9	11.9	9.5	10.3	8.3	9.7
Olympia, Wash. ....	9.5	14.6	18.1	20.1	26.2	22.5	22.6	23.4	10.0	15.1	9.7	11.5
Tatoosh Island, Wash. ....	5.2	6.7	9.1	8.9	9.8	9.1	9.5	9.4	7.7	7.9	7.2	7.6
Portland, Oreg. ....	13.0	15.0	17.8	19.8	24.9	21.2	19.1	24.2	17.1	17.1	13.7	12.0
Roseburg, Oreg. ....	11.3	17.1	18.2	17.6	25.3	20.6	22.2	(*)	(*)	20.0	16.7	14.5
<b>Middle Pacific Coast:</b>												
Cape Mendocino, Cal. ....	9.5	11.3	12.0	10.3	11.0	11.0	9.9	11.8	10.8	11.8	11.3	9.5
Red Bluff, Cal. ....	16.6	18.6	17.7	19.4	23.1	22.4	23.4	29.6	25.8	25.8	23.7	16.4
Sacramento, Cal. ....	18.0	17.2	14.0	16.4	19.8	18.7	25.2	27.9	26.0	22.0	22.9	14.6
San Francisco, Cal. ....	8.1	10.3	9.3	10.4	11.8	9.9	12.7	11.0	10.7	11.4	9.9	7.9
<b>South Pacific Coast:</b>												
Los Angeles, Cal. ....	21.5	16.5	16.1	19.3	18.4	21.1	28.3	27.0	25.7	23.1	25.2	17.2
San Diego, Cal. ....	19.0	14.4	12.5	13.3	11.4	13.7	14.6	14.1	12.9	14.6	18.1	13.7
<b>Alaska Stations:</b>												
Saint Michael's, Fort, Alaska. ....	15.5	15.4	13.1	12.3	12.2	13.0	9.3	11.3	9.5	11.0	12.7	14.9
Sitka, Alaska. ....	9.6	12.0	9.3	14.0	11.0	11.4	11.5	11.3	13.1	10.9	9.4	11.0
Unalashka, Alaska. ....	9.2	6.9	11.0	13.0	11.9	12.6	12.8	9.8	11.2	10.7	8.4	8.9
Behring's Island, Behring Sea. ....	8.6	8.4	8.5	9.1	9.0	9.3	9.0	7.5	10.7	9.0	8.3	9.3

<sup>1</sup>22 days.    <sup>2</sup>29 days.    <sup>3</sup>26 days.    <sup>4</sup>28 days.    <sup>5</sup>Record incomplete.    <sup>6</sup>No record.    <sup>7</sup>27 days.

## APPENDIX 14

*Highest temperature (in degrees Fahrenheit), and year in which it occurred, at stations of the commencement of observations at each,*

[From self-regis-

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
<b>New England:</b>										
Eastport, Me. ....	51	1874	47	1874, 1878	53	1878	63	1877	80	1877
Portland, Me. ....	58	1876	58	1880	65	1874	78	1881	94	1880
Mount Washington, N. H. ....	43	1874	43	1883	47	1876	50	1883	62	1879, 1880
Boston, Mass. ....	60.5	1876	64	1880	72	1880	85	1872	97	1880
Thatcher's Island, Mass. ....	60	1880	60	1880	66	1880	76	1881	86	1880
Block Island, R. I. ....	56	1883	54	1884	55.3	1884	62	1883	78.3	1881
Narragansett Pier, R. I. ....	48	1884	52	1883	60	1884	66	1882	75	1883, 1884
Point Judith, R. I. ....	50	1884	47	1884	58.2	1884	59	1883, 1884	70	1884
New Haven, Conn. ....	63	1876	65	1880	69	1880	75	1880	89	1880
New London, Conn. ....	65	1880	62	1880	64	1878	74	1880	89	1881
<b>Middle Atlantic States:</b>										
Albany, N. Y. ....	59	1876	58	1880	64	1878	80	1881	92	1880
New York City ....	64	1876, 1880	69	1874	72	1879	81	1872, 1877	94	1880
Philadelphia, Pa. ....	67	1876	75	1874	75	1880	87	1872	96	1880
Atlantic City, N. J. ....	64	1880	71	1880	72	1880	79	1878	89	1877, 1880, 1881
Barnegat City, N. J. ....	61	1874, 1879, 1880	70	1880	73	1880	79	1880	91	1880
Cape May, N. J. ....	58	1874, 1876	59	1880	65	1880	76	1879	81	1874, 1880
Little Egg Harbor, N. J. ....	51.4	1884	61	1883	61	1883	74	1882	90.3	1884
Sandy Hook, N. J. ....	63	1874	71	1874	67	1880	77	1880	88	1880
Delaware Breakwater, Del. ....	56	1882	66	1880	73	1880	79	1880	89	1880
Baltimore, Md. ....	71	1876	78	1874	76	1880	84	1881	95	1881
Ocean City, Md. ....	58	1883	71	1883	65	1883	74	1883	85.7	1884
Washington City. ....	71	1874, 1876	73	1874	79	1880	90	1872	96	1880
Cape Henry, Va. ....	78	1876	80	1880	83	1879	85	1876, 1878, 1880, 1881	98	1875
Chincoteague, Va. ....	60	1882	71	1883	72.2	1882	79	1881	88	1881
Lynchburg, Va. ....	72	1876, 1879	75	1874	79	1879	91.5	1873	94	1877
Norfolk, Va. ....	80	1871	81	1871	81	1880	92	1871	98	1880
<b>South Atlantic States:</b>										
Charlotte, N. C. ....	70	1879, 1880	76.5	1883	79	1880	85	1880, 1881	94.4	1881
Hatteras, N. C. ....	68	1884	71	1884	69.8	1884	75	1881	88	1881
Kitty Hawk, N. C. ....	73	1876	77	1880	80	1878, 1880	84	1878, 1880	93	1880



## APPENDIX 14.

*Signal Service, United States Army, for each month and the year. (Compiled from the com-  
to and including December, 1884.)*

tering thermometers.]

June.		July.		August.		September.		October.		November.		December.		Highest on record.	
°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
82	1884	86	1873, 1880	88	1880	82.8	1884	80	1879	84	1883	54	1877	88	1880
94	1878	97	1876	95	1876	94.5	1881	83	1879, 1881	66	1883	59	1884	97	1876
71	1878	73	1881	74	1872	65	1880	59	1871	47.8	1881	43	1884	74	1881
96	1874	101	1880	96.8	1881	101.5	1881	90	1881	75	1876	66	1881	101.5	1881
87.7	1884	89.0	1883	85	1876, 1879, 1880	95	1881	81	1879	66	1883	67.4	1881	95	1881
82.6	1884	86	1881, 1883	83	1883	86.5	1881	75.4	1881	70	1881	60	1884	86.5	1881
91	1884	89	1882	91	1882	89	1882	79	1884	73	1882	59	1884	91	1884
78	1883	84	1883	82	1883	80	1884	72	1884	70	1882	58	1884	84	1883
92	1880, 1884	95	1876	90	1873, 1876, 1881, 1884	100	1881	86	1881	71.5	1882	63	1875	100	1881
89	1880	98	1876, 1878	90	1873	93	1881	83.7	1879	72	1882	60.5	1879	93	1876, 1878
98	1874	94	1883	98	1876	96	1881	84	1881	70	1876	63	1881	96	1881
95	1875	99	1876	96	1881	100.2	1881	88.8	1881	74	1882	66.2	1881	100.2	1881
97	1874	100	1876	99	1881	101.5	1881	87	1879, 1881	77	1876	70	1873	101.5	1881
98	1874, 1880, 1881	99	1880	91.8	1881	94	1880	83	1881, 1884	72	1882	64	1877	99	1880
95.6	1882	96	1879	95	1874	96	1881	82.5	1881	73	1879	63	1875	96	1879, 1881
89	1873, 1880	91	1872	88	1873, 1877	87	1880	85.7	1884	69	1879, 1884	62	1881	91	1872
96	1882	99	1882	98	1882	95	1882	81.6	1884	75	1882	59.4	1884	99	1882
97	1874	100	1876	96.2	1881	101	1881	87	1881	78	1881	68.5	1881	101	1881
99	1880	91	1880	93	1881	93	1881	84	1881	78	1881	69	1881	93	1881
97.5	1874	99	1876, 1879, 1880	98	1881	101	1881	89	1879, 1881	78	1879	71	1881	101	1881
89	1883	88	1884	89	1882	85.6	1884	83.9	1884	68	1884	61	1884	89	1882, 1883
102.5	1874	102	1879	101	1881	104.8	1881	92.8	1881	80	1879	73	1873	104.8	1881
96	1874	101	1875, 1878	108	1881	94	1875, 1877, 1881	89	1879, 1881, 1883	81	1876, 1879, 1883	76	1875	108	1881
98	1880	94.5	1884	91	1881	87.8	1884	84.2	1884	79	1882	64	1881	94.5	1884
97	1874	101.8	1881	100	1881	98.8	1881	91.3	1884	80.2	1882	73	1873	101.8	1881
102	1874	102.5	1876	99	1881	96	1880	89	1881, 1884	80	1879	73	1873, 1874, 1875, 1879	102.5	1876
97	1881	101	1879	100.5	1881	94	1881	91.9	1884	80	1879	71	1884	101	1879
91	1882	92	1881	92	1881, 1883	90	1881	90	1881	79	1882	71	1884	92	1881, 1883
89	1880	100	1876	99	1881	95	1880	90	1881	79	1879	73	1875, 1879	100	1876

*Highest temperature (in degrees Fahrenheit), and year in which it occurred, at stations of*

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
<b>South Atlantic States—Cont'd:</b>										
Macon, Fort, N. C. ....	63	1882	70	1882	70.7	1884	74.3	1884	91	1881
New River Inlet, N. C. ....	69	1883	71	1884	75	1884	88.9	1884	86.1	1884
Scott's Hill, N. C. ....	69	1884	78	1883	80.8	1884	85.5	1884	84.5	1884
Smithville, N. C. ....	73	1876	72	1880	75	1884	85.6	1884	90	1881
Wilmington, N. C. ....	77	1879	81	1880	84	1878	90	1880	95	1878
Charleston, S. C. ....	80	1879	78	1876, 1880, 1882	86	1882	87	1880	94	1878
Augusta, Ga. ....	79	1879	82	1883	89.3	1882	90	1880	100	1878
Savannah, Ga. ....	80	1879	80	1876, 1880, 1883	87	1882	89	1873	98	1878
Jacksonville, Fla. ....	80	1875, 1876, 1877, 1879	88	1870, 1883	68	1882	91	1874, 1880	98.5	1878
<b>Florida Peninsula:</b>										
Cedar Keys, Fla. ....	77	1880	79	1883	82	1882	88	1880	91	1880, 1881
Key West, Fla. ....	90	1877	87	1874	89	1878, 1874	91	1881	93.2	1881
Sanford, Fla. ....	86	1883	86	1883	88.5	1884	91.5	1884	94.7	1884
<b>Eastern Gulf States:</b>										
Atlanta, Ga. ....	73	1879, 1882	74.5	1883	81	1882	86	1880	91	1879
Pensacola, Fla. ....	73.6	1882	78.3	1883	82.7	1884	87.2	1883	93	1881
Mobile, Ala. ....	78	1882	78	1883	85	1879	90	1881, 1883	98	1878
Montgomery, Ala. ....	73.5	1882	81.2	1883	86.3	1882	90	1880	98	1875
Vicksburg, Miss. ....	80	1879	83.1	1883	85	1878, 1880	90	1881	95	1874, 1877
New Orleans, La. ....	78	1879	80	1883	84	1879	86	1882	92	1877
<b>Western Gulf States:</b>										
Shreveport, La. ....	78	1876, 1880	80.5	1876	90	1882	93	1880, 1882	101	1875
Fort Smith, Ark. ....	68.6	1884	78.4	1883	82.8	1884	88.5	1883	93.3	1883
Little Rock, Ark. ....	78	1880	77	1882	83	1882	94	1880	91	1880
Galveston, Tex. ....	75	1876, 1880, 1882	75	1882, 1884	85	1879	85	1878	91	1875, 1877
Indianola, Tex. ....	80	1880	80	1875, 1880	90	1879	91	1877	95	1879
Palestine, Tex. ....	76.5	1884	78	1882	84	1882	87.5	1883	90	1883
<b>Rio Grande Valley:</b>										
Brownsville, Tex. ....	83	1876	85	1876	92.3	1884	97	1878, 1879	99	1877
Rio Grande City, Tex. ....	90	1879	92	1882, 1884	98.2	1884	109	1878	112	1879
<b>Ohio Valley and Tennessee:</b>										
Chatanooga, Tenn. ....	73	1879	74	1880	82.5	1882	88	1880	93	1879
Knoxville, Tenn. ....	74	1876	79	1871	83	1882	88	1872	94	1877
Memphis, Tenn. ....	73	1876, 1880	79	1883	85	1879	88	1882	96	1879
Nashville, Tenn. ....	74	1879	77.4	1883	81.7	1882	90	1872	93	1874, 1879
Louisville, Ky. ....	71	1876	77.5	1883	79	1879	88.5	1883	98	1881
Indianapolis, Ind. ....	69	1876	72	1883	77	1875	85.8	1883	89	1874, 1881

*the Signal Service, United States Army, for each month and the year, &c.—Continued.*

June.		July.		August.		September.		October.		November.		December.		Highest on record.	
o	Year.	o	Year.	o	Year.	o	Year.	o	Year.	o	Year.	o	Year.	o	Year.
88	1881	89.5	1883	91	1888	87	1881	87	1881	78	1882	69	1881	91	1881, 1883
89	1883	94	1883	94	1883	98	1883	98.1	1884	77.2	1883	72	1884	94	1883
83	1883	100	1883	96	1883	92	1882	90	1883	81.1	1883	73	1884	100	1883
97	1880	100	1879	97.5	1876	93	1876	88.5	1884	78	1877	71	1875	100	1879
100	1880	103	1879	99	1878	96	1872	92.5	1884	83	1877, 1879	78	1879	103	1879
100	1877, 1880	104	1879	97.5	1881	94	1876	98	1883	82	1879	76	1881	104	1879
101.8	1881	105	1878	105	1878	97	1875	93.5	1884	84	1879	77	1874, 1875, 1880	105	1878
100	1880	105	1879	100	1878	96	1876, 1877	92	1884	82	1875	80	1875	105	1879
100.5	1880	104	1879	100	1874	98	1875	92	1883	84	1875, 1877	81	1875	104	1879
94	1880	94	1880, 1881	96	1883	94	1881	89	1881, 1884	81	1881, 1882	78	1881	96	1883
95.5	1881	97	1880	95.4	1881	95	1872	92	1876	91	1876	88	1876	97	1880
98	1883	90.4	1883	96.9	1883	94.8	1884	94	1884	85.5	1884	84.6	1884	90.4	1883
94.8	1881	97.5	1881	96.2	1881	90.5	1881	90.8	1884	80.5	1882	71	1879	97.5	1881
97	1881	97.2	1884	94	1884	93.5	1884	95.2	1884	81.3	1882	76	1880	97.2	1884
100	1877, 1882	101	1883	100	1874	90	1881	91.4	1884	82	1882	78.8	1884	101	1883
105.5	1881	106.9	1881	103	1874	97	1-75, 1-77, 1884	96.1	1884	83	1879, 1882	77.1	1884	106.9	1881
101	1881	100	1874, 1881	100	1878	98	1881	98.7	1884	84.5	1882	79	1873, 1875	101	1881
97	1881	96	1877	90.5	1877	92.3	1884	90	1884	82	1879, 1882	78	1871, 1884, 1879, 1880	97	1881
104	1875	107	1875	103	1881	101	1881	93	1883	86	1882	79	1875	107	1875
101	1882	104.5	1884	103.7	1884	98.9	1884	94.6	1884	86	1882	78.1	1883	104.5	1884
98	1882	101.3	1884	102	1881	97	1881	90	1881, 1884	83	1882	74	1880, 1883	102	1881
97	1875	97	1875	98.5	1874	94	1875, 1876	87.2	1884	82	1873, 1876	73	1879, 1881, 1883	98.5	1874
98	1878	98	1872, 1876, 1879, 1884	100	1-71, 1877	96	1877	93	1877	87.8	1882	79	1879	100	1874, 1877
96	1882	98.2	1884	97.9	1884	95.5	1883	94	1883	86	1882	76.2	1884	98.2	1884
102	1878	96	1877, 1883	101	1877	96	1877, 1-78, 1879, 1883, 1884	95	1877	89	1882	83	1873, 1880	102	1878
109	1883	110	1884	112	1877	107	1877	105	1877	92.7	1883	88	1880	112	1877, 1880
95	1881	101	1879	100.5	1881	96	1881	90.8	1884	78	1882	72	1879	101	1879
96	1880	100	1879	100	1881	97.1	1881	94	1884	80.5	1881	75	1874	100	1879, 1881
100	1881	99	1875, 1879, 1881	102	1881	98	1881	92	1879, 1884	82	1879	74	1875	102	1881
99	1874	101.2	1881	104	1874	98.2	1881	91.9	1884	80.6	1882	75	1874	104	1874
100	1-74	102	1874	104.6	1881	99	1881	90	1884	78	1879	74	1875	104.6	1881
96	1874	101	1881	101	1881	94.5	1881	87	1884	73	1879	68	1875	101	1881

*Highest temperature (in degrees Fahrenheit), and year in which it occurred, at stations of*

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
<b>Ohio Valley and Tennessee—Cont'd.</b>										
Cincinnati, Ohio.....	60	1876	73	1883	77	1875	85	1872, 1878	94	1874, 1875
Columbus, Ohio.....	64	1880	72	1883	71	1879	86	1883	92	1881
Pittsburg, Pa.....	75	1874	76.5	1883	80	1876	88	1878	95	1881
<b>Lower Lakes:</b>										
Buffalo, N. Y.....	65.5	1874	63.8	1883	72	1875	82.6	1883	87	1876
Oswego, N. Y.....	64	1874	61	1880	67	1871	78	1872, 1884	94	1879
Rochester, N. Y.....	60	1874	63	1875	60	1875	83.5	1883	90	1879
Erie, Pa.....	73	1876	70	1883	78	1875	86	1883	91	1879
Cleveland, Ohio.....	70	1874	72	1883	76	1875	85	1872, 1883	92	1879
Sandusky, Ohio.....	64	1880	70	1883	70	1878, 1879	80	1878	92	1879
Toledo, Ohio.....	66	1873, 1876	65	1883	75	1875	85	1872	95	1871
Detroit, Mich.....	65	1876	64.3	1884	75	1875	78.5	1883	90.5	1881
<b>Upper Lakes:</b>										
Alpena, Mich.....	52	1876, 1880	58	1880	66	1879	76	1881	91	1874
Escanaba, Mich.....	45	1879	52	1877	57	1879	65	1875, 1880	88	1881
Grand Haven, Mich.....	57	1880	58	1880	71	1878	80	1883	86	1877
Mackinaw City, Mich.....	39.8	1884	43	1883	52.2	1884	66.1	1884	79.5	1883
Marquette, Mich.....	56	1880	69	1877	70	1878	81	1877	92	1879
Port Huron, Mich.....	64	1876	59	1880	73	1875	81.4	1883	88	1881
Chicago, Ill.....	65	1876	68	1876, 1880	73	1875	83	1878	89	1874
Milwaukee, Wis.....	59	1871	60	1882	70	1878	82	1871	90	1874
Duluth, Minn.....	51	1877	57	1877	62	1878, 1879	75	1881	91	1874
<b>Upper Mississippi Valley:</b>										
Saint Paul, Minn.....	49	1879	59	1880	68	1879	82	1879, 1882	94	1874
La Crosse, Wis.....	59	1874	65	1882	72	1875	83	1879	96	1874
Davenport, Iowa.....	60	1874	66.7	1882	74	1875	81	1879	90	1874
Des Moines, Iowa.....	63	1880	68	1880	80	1880	89	1883	93	1880
Dubuque, Iowa.....	62	1874	67.2	1882	75	1875	84	1879	94	1874
Keokuk, Iowa.....	64	1874	69	1882	80	1875	85	1883	92	1874
Calro, Ill.....	70	1876, 1880	74	1883	84	1879	89	1872	92	1874
Springfield, Ill.....	64	1880	72	1882	73	1882, 1883	85	1883	88	1881
Saint Louis, Mo.....	72	1880	73.2	1882	82	1879	87.5	1883	98	1874
<b>Missouri Valley:</b>										
Leavenworth, Kans.....	65	1876	73	1876	84	1879	89	1880	94	1874, 1875
Omaha, Nebr.....	63	1879, 1880	66	1880	82	1879	89	1880	92	1880
Bennett, Fort, Dak.....	55	1882	63	1882	78	1882	86	1882	92	1881
Huron, Dak.....	45.5	1882	57.2	1882	74.8	1882	81.2	1882	83	1884
Sully, Fort, Dak.....	55	1876, 1882	67	1882	76	1883	83	1884	101	1874
Yankton, Dak.....	67	1880	68	1876	87	1879	89	1874	94	1880
<b>Extreme Northwest:</b>										
Moorhead, Minn.....	43	1884	49	1882	53	1884	74	1883	86	1881
Saint Vincent, Minn.....	36.3	1884	42	1882	49	1881	73	1881	85.1	1884
Bismarck, Dak.....	49	1880	60	1877, 1882	72	1878	80	1881	92	1880
Buford, Fort, Dak.....	47	1880	57	1882	70	1879, 1882	92	1881	95	1880

*the Signal Service, United States Army, for each month and the year, &c.—Continued.*

June.		July.		August.		September.		October.		November.		December.		Highest on record.	
°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
98.5	1874	103.5	1881	101	1881	96	1881	87.7	1884	75	1879	72	1875	103.5	1881
98	1879	106	1881	96	1881	98	1881	87	1884	74	1879	68	1881	103	1881
98	1874	102.7	1881	99.8	1881	101.6	1881	91.1	1884	79	1876	69	1875, 1876, 1880	102.7	1881
92	1878	90	1878	90.8	1881	88.1	1884	88	1879	68.8	1881	62	1875	92	1878
96	1875	100	1878	97.5	1888	98.4	1881	84	1877	71	1876	65	1875	100	1878
94	1875	96	1881	96	1874, 1881	98	1881	87	1879	71	1876, 1879	70	1875	96	1881
91	1874, 1875	94	1878	98	1881	92	1881	85	1879	78	1882	68	1875	94	1878
96	1874	96	1878	96.7	1881	98	1881	87	1879	72.5	1882	68	1875	96.7	1881
92	1880	96	1879	96	1881	95.8	1881	87	1879	75	1879	68	1879	96	1881
99	1872	97	1872, 1874	97	1881	95	1881	86	1872	72	1876, 1882	66	1875	99	1872
98	1874	100	1878	98.8	1881	97	1874	85	1879, 1884	69	1879, 1882	65	1875	100	1878
97	1874	97	1876	92	1878	98	1884	84	1884	68	1874	56	1875	97	1874, 1876
88	1874, 1881	92	1874, 1878	89	1876, 1878	84	1880	77.6	1884	62.6	1884	48	1875	92	1874, 1876
88	1874	90	1878	92	1881	85	1878, 1881	80	1879	69	1874	61	1877	92	1881
81.4	1884	80.2	1883	89.4	1884	88.9	1884	79	1884	60	1882	51.5	1883	89.4	1884
95	1879	100	1878	96	1879	97	1874	87	1879	66	1874	59	1875	100	1878
90	1878, 1879	95	1878	96.5	1881	97	1881	86	1879	67.6	1882	65	1875	97	1881
98	1872	99	1874	98	1874	98.9	1881	84	1879	72	1874, 1882	68	1875	99	1874
94	1872, 1874	95	1871, 1874, 1878	98	1874	94	1872, 1874	83.1	1884	70	1874, 1882	68	1877	98	1874
92.2	1883	99	1883	98	1881	90	1874	78	1879	65	1874	51	1883	99	1883
94	1874	100	1883	98	1880	94	1878	87	1879	72	1874	56	1877	100	1883
96	1874	101	1874	96	1874, 1881	92	1873	84	1879, 1884	70	1874	60	1877	101	1874
98	1874	98	1874	96.8	1881	94	1881	85	1879	71	1874, 1879	68	1877	98	1874
95.5	1881	98.5	1881	108	1881	98	1881	85.8	1884	71	1882	57	1883	108	1881
98	1874	101	1874	97.8	1881	94.2	1881	86	1879	69	1874, 1879	64	1877	101	1874
96	1878	100	1874	102	1878	97	1881	87	1879	74	1874, 1882	68	1875	102	1878
96	1872	99	1874, 1881	103	1881	97	1881	88	1872, 1881, 1884	80.5	1882	72	1875	103	1881
94	1881	101.5	1879	99.5	1881	94.7	1881	88	1879	76	1879	64	1883	101.5	1879
99	1881	104	1881	106.4	1881	101.5	1881	90	1879	82	1879	74	1875	106.4	1881
99	1875	104	1874	107	1874	101	1882	89	1871, 1874	77	1874	72	1875	107	1874
98	1881	105	1874	105	1874	96.8	1881	87	1879	74	1874	66	1875	105	1874
98	1881	101	1881	104	1881, 1882	95	1882, 1883	90	1880	69.8	1884	62	1881	104	1881, 1882
94.1	1883	99.2	1883	95.6	1881	95.9	1884	81.8	1884	66.9	1884	58	1881	99.2	1883
111	1874, 1876	106	1874	107	1876, 1881	107	1874	88.8	1884	70	1883	65	1875	111	1874, 1876
97	1876	103	1883	108	1878	100	1881	89	1879	76	1876	62	1875	103	1878, 1883
100.8	1883	95.1	1881	93.5	1882	88	1882	77.7	1884	56.3	1884	55	1883	100.8	1883
96	1883	93	1883	90	1882	89	1883	77	1880	58.7	1884	44.8	1884	93	1883
99	1883	102	1881	105	1876	94	1882	88	1879	67	1876	60	1881	105	1876
107	1883	104	1881	107	1882	100	1882	95	1879	62	1879	56.8	1884	107	1882, 1883

*Highest temperature (in degrees Fahrenheit), and year in which it occurred, at stations*

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
<b>Northern Slope:</b>										
Aasinaboine, Fort. Mont.....	46	1882	56	1892	67	1882	81	1881	86.1	1884
Benton, Fort. Mont.....	58	1830	62	1843	74	1882	81	1880	93	1875
Custer, Fort. Mont.....	60	1880	65	1881	76	1882	85	1881	84	1880
										1881, 1882, 1883, 1884
Helena, Mont.....	51.2	1884	60	1881	66	1881	73	1881	77	1880, 1881, 1882
Maginnis, Fort. Mont.....	48.1	1884	57	1883	56	1883	65.6	1884	78.4	1884
Shaw, Fort. Mont.....	51	1884	58	1883	71	1882	80	1880	84	1881
Deadwood, Dak.....	62	1883	62	1883	73	1882	82	1881	84	1880
Cheyenne, Wyo.....	63	1880	59	1879, 1880, 1881	77	1879	80	1874	88	1874
North Platte, Nebr.....	70	1880	68.3	1882	86	1879	92	1880	94	1880
<b>Middle Slope:</b>										
Denver, Colo.....	67	1882	72	1879	81	1879	83	1874	92	1874
Pike's Peak, Colo.....	80	1879	29	1876	43	1879	39	1876	47	1880
West Las Animas, Colo.....	68.2	1884	71.2	1884	79.3	1884	82.5	1882, 1883	91	1883
Dodge City, Kans.....	70	1876	78	1876	89	1879	92	1880	98	1870, 1880
Reno, Fort. Ind. T.....	72	1880	73	1884	82	1883	91	1883	90	1884
Elliott, Fort. Tex.....	81	1880	78	1880	86	1880	96	1880	91	1880
<b>Southern Slope:</b>										
Sill, Fort. Ind. T.....	75	1880	79	1879, 1880	95	1879	96	1880	97	1880
Concho, Fort. Tex.....	78	1879	57	1880	97	1879	98	1880	107	1879
Davis, Fort. Tex.....	77	1880	79	1879	87	1879	93	1879	101	1881
Stockton, Fort. Tex.....	82	1880	83	1879	92	1879	101	1879	104	1879
<b>Southern Plateau:</b>										
Santa Fe, N. Mex.....	76	1879	73	1879	82	1879	84	1879	89	1873
El Paso, Tex.....	74	1880, 1881	82	1879	88	1879, 1882	94	1879	102.8	1884
Apache, Fort. Ariz.....	67	1881, 1882	74	1881	83	1879	89	1879	93	1881
Grant, Fort. Ariz.....	77	1879	80	1879	87	1879	93	1879	94	1879
Phoenix, Ariz.....	86.7	1883	87.5	1881	94	1879	104.9	1882	107.2	1883
Prescott, Ariz.....	71	1882	80	1879	93	1879	96	1879	90	1878
San Carlos Agency, Ariz.....	72	1881	79	1884	87	1882	95	1882	102	1883
Thomas, Camp, Ariz.....	70	1881	73	1881	85	1881	92	1881	97	1881
Verde, Fort. Ariz.....	73	1879	81	1879	90	1881	96	1879	98.5	1884
Wickenburg, Ariz.....	76	1879	82	1879	92	1879	98	1879	97	1884
Yuma, Ariz.....	90	1879	90	1879	100	1879	105	1876	108.7	1883
<b>Middle Plateau:</b>										
Winnemucca, Nev.....	57	1878	69	1879	62	1879	79	1881	86	1881, 1882, 1883
Salt Lake City, Utah.....	54	1879	68	1879	77	1879	83	1874	91	1874
<b>Northern Plateau:</b>										
Boise City, Idaho.....	61.5	1884	61	1879	76	1881	80	1879	88	1881
Conr d'Alene, Fort. Idaho.....	50	1884	60	1884	80	1884	78	1884	85	1884
Lewiston, Idaho.....	59	1880	63	1881	78.5	1882	86	1880	92	1880
Dayton, Wash.....	61	1880	64	1881	83	1881	91	1880	90	1880
Spokane Falls, Wash.....	50.9	1884	52	1881	74	1881	73	1884	88.8	1884
<b>North Pacific Coast:</b>										
Canby, Fort. Wash.....	55	1881	68	1884	64.2	1884	78.2	1884	76	1884
Olympia, Wash.....	51	1884	59.1	1884	71	1881	82	1880	87	1878, 1884
Portland, Oreg.....	59.2	1881	64.7	1884	76.5	1881	85	1880	90	1884
Roseburg, Oreg.....	65	1878	68.7	1883	80	1881, 1883	84.5	1880	88.2	1884

of the Signal Service, United States Army, for each month and the year, &c.—Continued.

June.		July.		August.		September.		October.		November.		December.		Highest on record.	
o	Year.	o	Year.	o	Year.	o	Year.	o	Year.	o	Year.	o	Year.	o	Year.
101	1883	95	1882	98	1882	98	1882	83	1884	68.1	1884	63.8	1884	101	1888
101	1881	107	1881	108	1881	95	1881	87	1875	71.6	1884	69.2	1884	108	1881
107	1883	103	1881	108	1882	95	1883	87	1879	69	1879	61	1881	107	1883
95	1880	98	1880	95	1880	86	1880	75	1880	63	1884	52	1883, 1884	98	1880
92	1883	92	1882	100	1882	98	1882	76.2	1884	66.8	1884	68.4	1884	100	1882
95	1880	95	1881, 1882	90	1881	91	1880	80	1880	67	1884	62.2	1884	90	1881
95	1880, 1881	102	1881	101	1881	91	1881	77	1880	68	1878	58.7	1883	102	1881
97	1880, 1881	100.5	1881	96.1	1882	88	1875	80	1878, 1874, 1879	60	1872, 1876	64	1877	100.5	1881
101	1876	107	1877	103	1878	101	1881	89	1879	79	1876	67	1878	107	1877
99	1873	102.3	1874	105	1878	93	1878	86	1873	76	1876, 1879	71	1874	105	1878
63	1881	64	1879	62	1878	55	1875	47	1879	33	1878, 1879	30	1877	64	1879
100	1882	104	1883, 1884	101	1882, 1884	97.5	1883	90.5	1884	77	1883	69.7	1884	104	1883, 1884
102	1880	108	1876	101.6	1881	99.3	1881	90	1883	83	1875	73	1875	108	1876
98	1884	105	1884	99.6	1884	98	1883	91	1884	83	1883	74	1883	105	1884
100	1880, 1881	102	1881	101	1881	98	1881	88	1880	81	1882	86	1880	102	1881
105	1881	107	1884	105	1881	100	1881	91	1878, 1884	83	1879	77	1880	107	1884
110	1882	108	1879	103.4	1883	100	1879	97	1877	85	1882	80	1879, 1880	110	1882
111	1881	110	1881	100	1884	94	1883	90	1881	81.6	1883	80	1881	111	1881
102.6	1881	107.4	1884	105	1877	100	1879	96	1878	87.6	1883	81	1879, 1881	107.4	1884
92	1881	95.5	1878	97	1878	90	1879	85	1878	77	1878	65	1878	95.5	1878
118	1883	111	1884	110.2	1884	104	1879	94	1879	82	1882	74.8	1881	118	1883
101	1883	102.5	1881	98	1879	96	1883	85.3	1884	77	1882	70	1881, 1882	102.5	1881
101.5	1883	100.9	1884	103	1879	98	1879	91	1878	79	1878, 1879	74	1878	103	1879
119	1883	114.6	1884	116	1883	114	1883	100.3	1884	97.3	1884	91.6	1882	119	1883
102	1878	103	1878	99	1878	100	1879	86	1881	75	1878	70	1881	103	1878
113	1883	114	1884	110	1884	108	1883	98	1881	82	1882	73	1881	114	1884
109	1883	112.5	1884	106.5	1884	100	1883	69.5	1881, 1884	81.5	1882	72	1881	112.5	1884
109.5	1881	114	1881	106	1878	104	1877	95	1881	80	1878	71	1878	114	1881
111	1884	112	1884	111	1877	108	1877	95	1877	86	1884	82	1884	112	1884
117	1883	118	1878	115	1879	113	1879	102	1876, 1879	91	1879	80	1878	118	1878
95	1881	104	1877	102.5	1882	94	1878, 1880	84	1879	67	1879	65	1878	104	1877
100	1883	98	1877	101	1875	93	1875	83	1876	70	1882	61	1874	101	1875
98	1883	106	1877	105	1883	96	1878	85	1879, 1880	70	1878	59	1879	106	1877
94	1883	95	1883	100	1882	89	1882	71	1883	59	1883	50	1883	100	1882
98	1883	104.8	1882	106.6	1882	93.5	1883	84	1880	65.2	1883	63	1879	106.6	1882
97.5	1884	102	1880	101.8	1884	91.3	1881	92	1880	66	1883	59.8	1881	102	1880
95.4	1883	97.5	1882	101.5	1882	87	1882	70.5	1884	58	1881	50	1881	101.5	1882
68	1884	73.2	1884	90.3	1884	86.4	1883	67	1884	64	1884	57	1883	90.3	1884
95	1878	93.5	1880	92	1884	81	1877, 1879	73	1880	63	1884	59	1880	93	1878
90	1876	95.5	1875	94.2	1884	90	1876	79	1876	68	1873	63	1875, 1880	90	1876
93.5	1878	97	1880	97.2	1884	90	1877, 1879	76	1877, 1880	69.7	1884	65	1880	97.2	1884

*Highest temperature (in degrees Fahrenheit), and year in which it occurred, at stations*

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
<b>Middle Pacific Coast:</b>										
Cape Mendocino, Cal.....	61.5	1884	63.5	1884	69	1883	63.1	1884	74	1883
Red Bluff, Cal.....	71.5	1880	80	1883	85	1881	90	1878	101.4	1883
Sacramento, Cal.....	64	1881	73.5	1879	80	1882	84	1881	98	1883
San Francisco, Cal.....	60	1877	71	1884	77	1879	81	1875	86	1883
<b>South Pacific Coast:</b>										
Los Angeles, Cal.....	82	1883	86	1881	99	1879	94	1881	100	1883
San Diego, Cal.....	78	1877	82.6	1883	99	1879	87	1876	94	1879
<b>Alaska Stations:</b>										
Alexander, Fort, Alaska.....	40	1882, 1883	37	1883	41	1883	48	1883	61	1882
Atka, Alaska.....	45	1884	46	1884	45	1883	52	1883, 1884	53	1882, 1884
Hoonah, Alaska.....	47	1884	47	1884	51	1883	63	1883	76	1883
Pyramid Harbor, Alaska.....	48	1884	48	1883	50	1883	68	1883	70	1883
Saint Michael's, Fort, Alaska....	43.6	1883	41	1883	43.5	1884	44	1882	57	1877
Sitka, Alaska.....	50.8	1882, 1883	52.5	1884	55.8	1883	65.7	1883	69.2	1882
Unalashka, Alaska.....	52	1882	51	1882	50	1882, 1884	59	1884	66	1883
Behring's Island, Behring Sea....	36.6	1884	38	1883	38.9	1884	39.5	1884	56	1883



*of the Signal Service, United States Army, for each month and the year, &c.—Continued.*

June.		July.		August.		September.		October.		November.		December.		Highest on record.	
°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
83	1883	69	1888	69	1883	90	1888	75.8	1884	73	1872	71	1883	90	1883
105	1878	110	1879	110.5	1878	106	1877	94	1877	80	1879	74	1883	110.5	1878
102.5	1883	103.5	1883	103	1879	101	1883	88	1877	76	1880	68	1883	103.5	1883
95.2	1883	83	1881, 1884	80	1879	92	1877	84	1871	78	1871	68	1876	95.2	1883
103.5	1879	69	1884	101.5	1884	103.5	1883	96.5	1879	88	1884	88.2	1876	103.5	1879, 1883
94	1877	66	1877	81.5	1884	101	1883	92	1879	85	1873	89	1874	101	1883
78	1882	69	1883, 1884	78	1884	66	1882	65	1881	47	1881	48	1884	78	1882, 1884
72	1883	72	1883	68	1882, 1883	63	1882	54	1881, 1884	57	1883	45	1881	72	1883
76	1883	79	1883	75	1884	65	1884	56	1881, 1882, 1883	53	1884	54	1884	79	1883
78	1884	78	1884	74	1882, 1883	69	1882	65	1881	49	1884	49	1884	78	1884
75	1876	75	1877	69	1884	66.5	1883	60	1881	42	1874	45	1876	77	1876, 1877
74.6	1884	67.5	1883, 1884	79	1881	69.4	1883	60.8	1883	55.8	1884	56.3	1884	79	1881
68	1884	78	1882	78	1881	68	1881	62	1881	59	1881	50	1881	78	1881, 1883
60.7	1883	62.7	1884	63.6	1882	58.5	1882	49.9	1884	42.9	1883	40.7	1883	63.6	1883

## APPENDIX 15.

*Lowest temperature (in degrees Fahrenheit) and year in which it occurred at stations of the movement of observations at each,*

[From self-register

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
<b>New England:</b>										
Eastport, Me .....	-20	1874	-20	1876	-4	1883	2	1874	29	1883
Portland, Me .....	-11.5	1882	-7	1874, 1876	-7	1872	14	1874	34	1873, 1876
Mount Washington, N. H. ....	-46	1875	-4.2	1876	-49	1872	-18	1874	-1	1880
Boston, Mass .....	-13	1882	-6.5	1876	-7.5	1872	11	1874	31	1882
Thatcher's Island, Mass. ....	-8	1882	-4	1880, 1881	4.5	1884	18	1881	31	1880
Block Island, R. I. ....	-4	1882	2	1881	10	1883, 1884	25	1881	36	1882
Narragansett Pier, R. I. ....	1	1883	4	1884	4	1884	23	1882, 1883	33	1884
Point Judith, R. I. ....	1	1883	5	1884	5.7	1884	21.2	1884	32.8	1884
New Haven, Conn. ....	-14	1873	-4	1881	0.8	1884	16	1874	30.5	1882
New London, Conn. ....	-10	1882	-6	1871	4	1884	19	1874	32	1876, 1882
<b>Middle Atlantic States:</b>										
Albany, N. Y. ....	-18	1878	-18	1875	-4	1875	13	1874	29	1874, 1876
New York City .....	-6	1875	-4	1873	3	1872	20	1874	34	1876, 1880
Philadelphia, Pa. ....	-5	1875	-1	1875, 1881	5	1872	17.5	1874	36	1880
Atlantic City, N. J. ....	-3	1875	-5	1875	8	1884	19	1875	33	1876, 1880
Barnegat City, N. J. ....	-10	1875	-4	1881	10	1875	19	1875	34	1876, 1880
Cape May, N. J. ....	1	1879	2	1875	9	1872	24	1875	34	1882
Little Egg Harbor, N. J. ....	3	1883	12	1883	10.8	1884	28.4	1882	34.5	1882
Sandy Hook, N. J. ....	-3	1879	Zero.	1881	6.9	1884	12	1874	32	1874
Delaware Breakwater, Del. ....	9	1884	7	1881	15.8	1884	25	1881	40	1880
Baltimore, Md. ....	-6	1881	2	1873	5	1873	23.5	1875	34	1876
Ocean City, Md. ....	4	1884	14.8	1884	13.8	1884	27.2	1884	40	1883
Washington City .....	-14	1881	-1.5	1875	4	1873	22.5	1875	33.5	1876
Cape Henry, Va. ....	9	1879	11	1875	12	1883	28	1875	41	1876
Chincoteague, Va. ....	8	1882, 1884	5	1881	15	1884	26	1881	40	1880
Lynchburg, Va. ....	-4	1877	3	1875	16	1884	25	1881	37	1876
Norfolk, Va. ....	8	1879	9	1875	16	1872	27	1875, 1880	38	1876
<b>South Atlantic States:</b>										
Charlotte, N. C. ....	5	1884	17.8	1884	23	1884	28	1881	40.5	1883
Hatteras, N. C. ....	15	1884	20	1881	26	1884	31	1881	47	1882
Kitty Hawk, N. C. ....	8.6	1884	11	1881	20	1876	29	1881	42	1876, 1877
Macon, Fort, N. C. ....	8.5	1884	20	1881	25.6	1884	30	1881	48	1882
New River Inlet, N. C. ....	4	1884	23	1884	23.1	1884	37	1883	46	1883
Scott's Hill, N. C. ....	4.9	1884	24.5	1884	20	1884	32	1884	45	1883
Smithville, N. C. ....	6	1884	18	1881	21	1876	29	1881	41	1878
Wilmington, N. C. ....	9	1884	15	1875	20	1873	28	1875	38	1876

## APPENDIX 15.

*Signal Service, United States Army, for each month and the year. (Compiled from the com-  
to and including December, 1884.)*

ing thermometers.]

June.		July.		August.		September.		October.		November.		December.		Lowest on record.	
°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
30	1875	45	1882, 1884	45	1880	35	1875	24	1881	-18	1875	-21	1884	-31	1884
43	1875	51	1876, 1882	48	1874	37	1875	28	1876, 1879	-6	1875	-17	1872	-17	1872
15	1878, 1879	27	1883	20	1876	11	1879	-3	1881	-40	1875	-47	1876	-49	1872
43	1884	46	1874	47	1880	34	1879	25	1879	-2	1875	-12	1883	-13	1883
40.1	1881	50	1879	45.5	1883	39.5	1883	28	1879	9	1880	-7.2	1884	-8	1883
46.2	1884	55	1883	54.5	1884	41.5	1883	32.6	1884	19	1880	-3.2	1884	-4	1882
41	1884	42	1884	45	1883	39	1883	28	1884	15	1882	-9	1883, 1884	-9	1883, 1884
43	1884	52	1883	49	1883, 1884	41	1883	29	1884	15	1882	-8	1883, 1884	-8	1883, 1884
41.4	1884	51	1879	45.7	1884	35	1879	24	1879	2	1875	-9.5	1884	-14	1873
43	1876, 1884	51	1879	47.5	1884	37	1879	27.2	1883	4	1875	-7.5	1883	-10	1882
40	1875, 1878	48	1876	45	1875	33	1875, 1879	23	1876	-10	1875	-17	1875	-18	1875, 1878
47	1878, 1879	57	1872, 1883	53	1874	36	1872	31	1876	7	1875	-6	1880	-6	1875, 1880
47.2	1884	56	1883	53	1872	43	1879	31	1873, 1876	8	1875	-5	1880	-5	1875, 1880
45	1878	53	1880	58	1879	43	1875	29	1879	10	1875	-7	1880	-7	1880
47	1878	53	1879	58	1879	41	1875	28	1876	11	1875	-7	1880	-10	1875
47	1876	56	1880	55	1882	42	1871, 1875	31	1873	14	1875	2	1880	1	1879
46	1884	51.2	1882	55	1883	47.2	1883	30.1	1884	21.3	1884	-2	1884	-2	1884
49	1874	50	1880	55	1874	46	1875	32	1876	8	1875	-5	1880	-5	1880
50	1881	59	1882	60	1881	51	1882	34.5	1884	23	1880	1	1880	1	1880
49	1873	59	1876, 1882	52	1874	40	1873, 1879	30	1873, 1876, 1879	15	1880	-3	1880	-6	1881
55	1883	54.1	1884	57	1883	45	1882	32.2	1884	22	1883	8	1884	4	1884
46.5	1873	56.1	1884	50	1874	38	1879	26	1873	12.5	1880	-13	1880	-14	1881
51.4	1884	60	1881	60	1874, 1879, 1881	53	1880	39	1875, 1880	24	1880	7	1880	7	1880
50.1	1884	59	1882	60	1880, 1881	46	1882	36.5	1884	18	1880	1	1880	1	1880
49	1880	55	1876, 1882	50	1874	40	1875, 1879	28	1879	13	1880	-5	1880	-5	1880
53	1876, 1884	60	1876, 1877	58	1874	50.5	1875	31	1876	20	1872	6	1880	6	1880
51.5	1884	60	1882	56	1879	43	1879	30	1879	18	1880	-5	1880	-5	1880
54.5	1884	63	1881	64	1881	60	1882	47	1884	32	1881	8	1880	8	1880
52	1884	61.5	1884	62	1879, 1881, 1882	53	1876	38	1876	23	1879	8	1880	8	1880
55.1	1884	65	1881, 1882	63	1881, 1883	58	1882	43.8	1884	28	1881	15.2	1884	8.5	1884
46.2	1884	63.4	1884	60.9	1884	58	1883	36.4	1884	24	1883	12	1884	4	1884
47	1884	60.1	1884	60	1883	50	1882	30.5	1884	24	1883	11	1884	4.9	1884
50.6	1884	61	1881	58	1883	49	1879, 1880	35	1876	23	1879, 1881	10	1880	6	1884
51	1884	62	1881	56	1874	47	1879	32	1876	20	1872	10	1880	9	1884

*Lowest temperature (in degrees Fahrenheit) and year in which it occurred at stations of*

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
<b>South Atlantic States—Continued:</b>										
Charleston, S. C. ....	18	1884	26	1881	28	1876	32	1881	47	1876
Augusta, Ga. ....	14	1884	23	1875	22	1873	21	1881	42	1877
Savannah, Ga. ....	18	1873	26	1884	27	1873	33	1881	48	1877
Jacksonville, Fla. ....	21	1884	32	1875, 1878	31	1873, 1876	37	1881	48	1877
<b>Florida Peninsula:</b>										
Cedar Keys, Fla. ....	25.3	1884	35	1881	40	1881	33	1881	50	1883
Key West, Fla. ....	48	1879	55	1872, 1877, 1878	53	1873	61	1873, 1881	63	1877
Sanford, Fla. ....	23.5	1884	40.4	1884	43	1884	49	1884	51	1883
<b>Eastern Gulf States:</b>										
Atlanta, Ga. ....	-1.3	1884	11	1884	24.5	1884	25	1881	30.5	1883
Pensacola, Fla. ....	16.3	1884	29	1884	36	1881	34	1881	46.6	1883
Mobile, Ala. ....	13.9	1884	28	1875, 1876	31	1873, 1876	33	1881	47.3	1883
Montgomery, Ala. ....	8	1884	22	1875, 1884	25	1873	30	1881	44	1883
Vicksburg, Miss. ....	10	1875	21	1875	27	1876	31	1881	46	1877
New Orleans, La. ....	20	1879	32.5	1875	36.5	1876	38	1881	56	1871, 1877
<b>Western Gulf States:</b>										
Shreveport, La. ....	6	1879	19.1	1884	26	1876	32	1881	47	1876, 1877
Fort Smith, Ark. ....	-5	1884	8	1883	23.5	1884	35.3	1884	45	1883
Little Rock, Ark. ....	5.5	1884	17	1884	25	1884	29	1881	44	1883
Galveston, Tex. ....	20	1883	28.5	1884	34	1875	44	1873	54	1876
Indianola, Tex. ....	15	1873	21.5	1883	32	1880	32	1875	51	1873
Palestine, Tex. ....	6.5	1884	13.5	1883	31.8	1884	33.4	1884	50	1882
<b>Rio Grande Valley;</b>										
Brownsville, Tex. ....	18	1881	27	1883	35	1880	43	1881	49	1877
Rio Grande City, Tex. ....	19	1881	32	1880	32	1884	43	1881	49	1877
<b>Ohio Valley and Tennessee:</b>										
Chattanooga, Tenn. ....	-1	1884	11	1884	22.8	1884	25	1881	41	1879
Knoxville, Tenn. ....	-16	1884	6	1873	6	1873	24	1875, 1881	37	1880
Memphis, Tenn. ....	-2	1884	13	1875	18	1876	27	1881	41	1883
Nashville, Tenn. ....	-10.2	1884	9	1875, 1876	11	1873	25.5	1875	37	1877
Louisville, Ky. ....	-19.5	1884	Zero.	1875	3	1873	21	1875	36	1873, 1876
Indianapolis, Ind. ....	-25	1884	-8	1875	5	1884	19	1875	31	1877
Cincinnati, Ohio. ....	-10	1879	-1	1875	1	1873	18	1875	35	1883
Columbus, Ohio. ....	-20.3	1884	-2	1881	6	1884	15	1881	34	1883
Pittsburg, Pa. ....	-12	1875	-10	1875	2	1877	14	1875	27	1876
<b>Lower Lakes:</b>										
Buffalo, N. Y. ....	-13.5	1884	-13	1875	-2	1884	11	1881	29	1876
Oswego, N. Y. ....	-13	1882	-10	1875	-11	1872	13	1874	31	1876
Rochester, N. Y. ....	-12	1873	-12	1875	-7	1872	11	1879	28	1880
Erie, Pa. ....	-15	1875	-16	1875	-1	1884	11	1881	32	1875, 1877, 1882, 1883
Cleveland, Ohio. ....	-17	1873	-11.2	1875	-2	1873	15	1875	28.3	1876

*the Signal Service, United States Army, for each month and the year, &c.—Continued.*

June.		July.		August.		September.		October.		November.		December.		Lowest on record.	
°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
58.3	1884	57	1876, 1881, 1882	62	1879	54	1879	39	1873	28	1873, 1881	13	1890	13	1880, 1884
57	1882	62	1876	61	1874	48	1876	29	1873	24	1873	7	1890	7	1880
58.5	1884	66	1876	63	1879	54	1871	37	1873	23	1872	15	1890	15	1880
61.7	1884	68	1877, 1879	66	1874, 1875	56	1874	40	1873	30	1873	19	1890	19	1880
63	1884	69	1881	69	1881	64	1880	49	1880	33	1881	22	1880	22	1880
71.2	1882	72.7	1883	72	1882, 1884	71.5	1883	65	1873, 1876	53	1873	44	1876	44	1876
63.6	1884	60.8	1884	60	1883	64	1884	55.5	1884	44.4	1884	36	1883	28.5	1884
54	1879	57.8	1882	57	1879	44	1879	33.6	1884	30	1881	1	1880	-1.3	1884
64	1881	64.2	1882	66.4	1884	57.3	1882	45	1880	28.1	1881	17	1880	16.3	1884
61	1879	63.8	1882	68	1884	53	1871	34	1873	27	1872, 1877, 1881	14	1880	13.9	1884
58	1877, 1879	60.8	1882	61.5	1879	51.5	1876	33	1873	21	1872	8	1880	8	1880, 1884
58	1879	62	1881	62	1879	48	1871	34	1873	28	1877, 1880	12	1880	10	1875
65	1879	69.8	1882	65.5	1884	58	1871	40	1873	31.5	1881	20	1870, 1880	20	1870, 1879, 1880
55	1877	64	1877, 1880, 1882	58	1880	47	1881	31	1873	18	1880	10	1880	6	1879
50	1882	61	1882	58.4	1884	39.6	1883	39	1884	23	1882	9.5	1882	-5	1884
55	1882	61	1882	59.2	1884	47	1881	39	1880	10	1880	4	1880	5.5	1884
64	1877, 1879	69	1880	70	1877, 1880, 1882	59	1875	45	1873	29	1880	18	1880	18	1880
60	1877	68	1877	67	1880	60	1878	46	1873, 1880	23	1880	14	1880	14	1880
55	1882	63	1882	62	1884	49	1883	41	1882	28.5	1882	15.2	1884	6.5	1884
68	1877	68	1877	68	1884	57	1883	49	1879	30	1880	18	1880	18	1880, 1881
62	1877	62	1877	65.7	1884	53	1883	43	1873, 1879	30	1880	24	1880	19	1881
51	1879	57.5	1882	57	1879	47	1879, 1880	34	1884	17	1883	3	1880	-1	1884
47	1878	53	1882	50	1879	40	1871	25	1876	11.5	1872	-5	1880	-16	1884
54	1879	60	1882	59	1880	44	1875	29	1878	16	1877, 1880	3	1876, 1880	-2	1884
49	1877	56.3	1882	54.7	1883	41	1875	28	1873	13	1873	-2	1876	-10.2	1884
49	1875	57	1882	56	1880	42	1875, 1876	27	1878	4.5	1872	-7	1880	-19.5	1884
45	1877, 1882	53	1882	48	1876	35	1875	23	1878	-5	1880	-15	1876	-25	1884
49	1877	58.2	1882	55	1872, 1875	41	1875	27	1873	5	1880	-8	1872	-10	1879
43	1879, 1882, 1883	54	1882, 1883	50	1883	37	1879	25	1879	-5	1880	-12	1880	-20.3	1884
39	1879	52	1874	49	1876	35	1879	28	1873, 1876, 1878	4	1880	-9	1880	-12	1875
40.5	1879	47.5	1876	44	1880	35	1873	24.7	1884	2.5	1875	-9	1880	-13.5	1884
40.5	1875	49	1875	44.4	1884	36	1879	25.6	1884	-1	1875	-17.5	1884	-17.5	1884
36	1879	48	1873, 1884	42.8	1884	34	1873, 1879	19	1879	1	1875	-11	1871	-12	1873, 1875
42	1879	52	1883	50	1883	40	1879	28	1876	6	1880	-11	1880	-16	1875
40	1879	49.6	1883	45.6	1876	38	1875	26	1876	Zero.	1880	-12	1872, 1880	-17	1873

*Lowest temperature (in degrees Fahrenheit) and year in which it occurred at stations of*

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
<b>Lower Lakes—Continued:</b>										
Sandusky, Ohio .....	-16.5	1879	-2.8	1884	6	1884	14	1881	24	1880
Toledo, Ohio .....	-14	1872, 1884	-12	1875	-3	1873	12	1875	30	1876
Detroit, Mich .....	-15	1875, 1879	-20	1875	-7	1872	8	1875	29	1875
<b>Upper Lakes:</b>										
Alpena, Mich .....	-27	1882	-27	1881	-19	1884	-2	1881	22	1888
Escanaba, Mich .....	-26	1881	-32	1875	-26.8	1884	2	1888	20	1882
Grand Haven, Mich .....	-12	1873	-24	1875	Zero.	1873, 1875	9	1874	28	1875
Mackinaw City, Mich .....	-15.9	1884	-16.6	1884	-20.2	1884	3	1883	28	1883
Marquette, Mich .....	-28	1881	-27	1875	-16	1884	8	1875	22	1875
Port Huron, Mich .....	-14.7	1883	-30	1875	-8	1875	7	1875	26.2	1882
Chicago, Ill .....	-20	1875	-18	1875	-12	1873	17	1875, 1879, 1881	27	1875
Milwaukee, Wis .....	-25	1875	-22	1875	-8.5	1884	12	1875	25	1875
Duluth, Minn .....	-38	1875	-34	1875	-26	1875	3	1874, 1881	26	1876
<b>Upper Mississippi Valley:</b>										
Saint Paul, Minn .....	-31.5	1884	-32	1875	-22.5	1873	7	1874	24	1875
La Crosse, Wis .....	-43	1873	-34	1875	-23	1873	10	1881	29	1875
Davenport, Iowa .....	-27	1884	-16	1875	-8	1884	16	1881	29	1875
Des Moines, Iowa .....	-30.4	1884	-23	1883	-5.6	1884	11	1881	33	1882
Dubuque, Iowa .....	-26.2	1881	-31	1875	-10	1875	14	1875	27	1875
Keokuk, Iowa .....	-24.2	1884	-11	1873	-2	1873	20	1875, 1879, 1881	29	1875
Cairo, Ill .....	-16	1884	4	1875	10	1873	24	1875	37	1875
Springfield, Ill .....	-22.3	1884	-2.4	1883	7	1884	19	1881	33.9	1888
Saint Louis, Mo .....	-21.5	1884	-3	1875	8	1873, 1876	22	1875	32	1875
<b>Missouri Valley:</b>										
Leavenworth, Kans .....	-29	1873	-12	1883	2	1876	13	1881	31	1875
Omaha, Nebr .....	-32	1884	-24.9	1883	-7	1880	6	1881	28	1875
Bennett, Fort, Dak .....	-42	1883	-34	1881	-11	1881, 1884	4	1881	30	1883
Huron, Dak .....	-38	1884	-31.8	1883	-14.6	1884	19.2	1882	26	1882
Sully, Fort, Dak .....	-39	1883	-30	1875, 1883	-22	1876	11	1875	15	1882
Yankton, Dak .....	-32	1881	-23.1	1884	-16	1876, 1880	-3	1881	24	1875
<b>Extreme Northwest:</b>										
Moorhead, Minn .....	-43	1884	-33	1881, 1883	-23	1884	-13	1881	26	1882
Saint Vincent, Minn .....	-14	1881, 1883	-38	1883	-31	1883	-14	1881	21	1882
Bismarck, Dak .....	-40	1884	-31	1875	-25	1875	1	1881	21	1875
Buford, Fort, Dak .....	-46	1883	-40	1883, 1884	-23	1880	7	1880	22	1882, 1888
<b>Northern Slope:</b>										
Assinaboine, Fort, Mont .....	-43	1883	-47	1883	-25.8	1884	7	1881	20	1881
Benton, Fort, Mont .....	-35	1875	-41	1883	-42	1876	-6	1875	26	1883
Custer, Fort, Mont .....	-31	1881	-38	1883	-23	1880	12	1882	23	1882
Helena, Mont .....	-34	1883	-32	1883	-9	1884	6	1881	25	1883
Maginnis, Fort .....	-29	1883	-35	1883	-14.1	1884	14	1883	19	1883

*the Signal Service, United States Army, for each month and the year, &c.—Continued.*

June.		July.		August.		September.		October.		November.		December.		Lowest on record.	
°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
47	1879, 1882	56	1880	48.5	1882	42	1879	30	1878, 1880, 1884	Zero.	1880	-13	1880	-16.5	1879
48	1873, 1875, 1878, 1879	50	1883	47	1879	36	1871	25	1876	5	1880	-15	1872	-15	1872
38	1875	50	1873, 1883	45	1875	29.8	1883	22	1878	Zero.	1880	-24	1872	-24	1872
22.5	1881	45	1876, 1882, 1883, 1884	39	1884	29.8	1883	20.9	1884	-4	1880	-15	1880	-27	1881, 1882
34	1875, 1879	42	1875	38	1875	26	1883	17	1878	-9	1880	-23	1880	-32	1875
40	1878, 1879	40	1873	42.5	1875	30	1879	26	1876	Zero.	1880	-12	1884	-24	1875
35.7	1883	46.8	1883	41.8	1884	34	1883	24	1883	8.4	1883	-5	1884	-20.2	1884
31	1881	40.8	1881	34.7	1883	28	1883	18	1878	-0	1875	-20	1880	-27	1875
37	1877	46.5	1884	46	1875, 1879	31	1879	23.8	1884	-6	1880	-14	1880	-20	1873
40	1875	50	1873	51.1	1884	37	1872, 1876	26	1873	-2	1872	-23	1872	-23	1872
40	1875, 1879, 1882	50	1875, 1876, 1880, 1883	42	1875	32	1876	22	1878	-5	1880	-21.6	1884	-25	1875
26	1875, 1876	46	1875	45	1876	30	1879, 1883	8	1878	-29	1875	-34	1879	-38	1875
39	1876, 1877	46	1873	43	1875	30	1873	15	1878	-24.5	1875	-30	1879	-39	1879
40	1876	52	1880, 1883	44	1875	31	1873	18	1873	-21	1875	-37	1872	-43	1873
43	1876, 1882	50	1884	44.5	1884	36	1879	18	1873	-3	1875	-17	1872	-27	1884
44	1882	52	1882	48	1879, 1883	34	1879	15	1876	Zero.	1880	-18.2	1884	-30.4	1884
40	1877	50.4	1882	41	1875	33	1873	20	1873	-9	1875	-19	1876, 1879, 1880	-31	1875
45	1877	56	1873, 1880, 1883	47	1875	39	1875, 1876, 1883	20	1873	-3	1872	-22	1872	-24.2	1884
50	1877	60	1883	57	1880	42	1876	24	1873	7	1872	-7	1872	-16	1884
48.7	1882	54	1883	48.9	1884	38	1879	26	1880	6	1880	-14	1880	-22.3	1884
48	1877	57	1876	54	1884	40	1875	25	1873	5	1872	-17	1872	-21.5	1884
45	1877, 1882	53.5	1882	50	1884	37	1876	19	1873	Zero.	1872	-14	1880	-29	1873
42	1877	51	1873	49	1877	30	1873	15	1878	-6	1875	-17	1879, 1884	-32	1884
23	1882	46	1882	42	1883	27	1883	10	1880	-18	1880	-41.3	1884	-42	1883
34	1883	46	1883	42.7	1883	23.2	1883	21	1881	-12.8	1884	-34.2	1884	-36	1884
37	1875	48	1877, 1882	41	1884	18	1881	9	1874	-18	1875	-30.5	1884	-39	1883
38	1876, 1877, 1879	44	1877	45	1875	26	1876	9	1878	-15	1875	-34	1879	-34	1879
23	1883	43	1883, 1884	38	1882	17	1883	14.9	1884	-15	1881, 1884	-34	1883	-43	1884
29	1883	40	1881, 1883	36	1881	17	1883	10.2	1884	-22	1880	-47.8	1884	-47.8	1884
32	1875	32	1884	39	1875	10	1876	6	1874, 1878	-28	1875	-38	1879	-40	1884
30	1883	37.5	1884	36	1883	18	1883	9	1881	-20	1881	-46	1879	-46	1879, 1883
31	1883	35	1881	37	1881	25	1884	-16	1881	-25	1880	-50	1884	-50	1884
27	1881	37	1874	34	1881	14	1873	-6	1881	-31	1875	-59	1880	-59	1880
30	1883	41	1883	36	1883	29	1880	10	1879	-24	1880	-47.5	1884	-47.5	1884
31	1880	38	1880	34	1880	30	1880, 1882	10	1881	-17	1880, 1881	-40	1880	-40	1880
33	1883	37	1884	30	1883	25.7	1884	14	1883	-16	1883	-30	1884	-35	1883

*Lowest temperature (in degrees Fahrenheit) and year in which it occurred at stations of*

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
<b>Northern Slope—Continued:</b>										
Shaw, Fort, Mont.....	-33	1883	-37	1883	-22.5	1884	-4	1890	21	1881
Deadwood, Dak.....	-30	1883	-32	1883	-7.2	1884	11	1890, 1881	21	1883
Cheyenne, Wyo.....	-38	1875	-28.2	1884	-17	1880	2	1875	23	1884
North Platte, Nebr.....	-27	1881	-29	1883	-21	1880	12	1875	30	1875
<b>Middle Slope:</b>										
Denver, Colo.....	-29	1875	-23	1883	-10	1880	4	1876	27	1873, 1872
Pike's Peak, Colo.....	-37	1883	-37	1875	-29	1875	-21	1875	-6	1875
West Las Animas, Colo.....	-21.5	1883	-22.7	1884	6	1882	18	1882	27.5	1884
Dodge City, Kans.....	-30	1883	-20	1883	-8	1880	13	1881	32	1884
Reno, Fort, Ind. T.....	-4	1884	-2	1884	14	1883	31	1884	37	1884
Elliott, Fort, Tex.....	-13	1883	-10	1883	-2	1880	20	1881	36	1884
<b>Southern Slope:</b>										
Sill, Fort, Ind. T.....	-9	1879	-3.5	1883	10	1880	26	1881	42.5	1883
Concho, Fort, Tex.....	-1	1881	6	1883	16	1880	29	1882	46	1878
Davis, Fort, Tex.....	Zero.	1881	9	1883	17	1880	25	1882	40	1880, 1884
Stockton, Fort, Tex.....	2	1881	8	1883	15	1880	24.2	1882	41.5	1882
<b>Southern Plateau:</b>										
Santa Fé, N. Mex.....	-13	1883	-3	1879, 1880	Zero.	1880	11	1875	24	1880
El Paso, Tex.....	-5	1881	12	1881	21	1880	29	1882	39.5	1884
Apache, Fort, Ariz.....	-6	1883	-9	1880	11	1881	15	1883	29	1880, 1883
Grant, Fort, Ariz.....	10	1883	17	1883	21	1882	29	1879	37	1882
Phoenix, Ariz.....	13.2	1883	19.1	1884	28	1881	30.1	1883	36.3	1884
Prescott, Ariz.....	-17	1880	-11	1880	-8	1876	12	1878	26	1877
San Carlos Agency, Ariz.....	16	1883	21	1882	22	1882	30	1882	38	1884
Thomas, Camp, Ariz.....	10	1884	16	1881	22	1881	24.3	1883	36.9	1884
Verde, Fort, Ariz.....	1.4	1883	10	1880	11	1881	27	1883	37	1880
Wickenburg, Ariz.....	13	1881	10.8	1882	20	1880	30	1878, 1880	38	1880
Yuma, Ariz.....	22.5	1883	25	1880	31	1881	40	1878	48.9	1884
<b>Middle Plateau:</b>										
Winnemucca, Nev.....	-23	1883	-19.5	1883	-3	1882	17	1882	20	1879
<b>Salt Lake City, Utah:</b>										
Boisé City, Idaho.....	-20	1883	-13	1884	4	1874	19	1875	32	1880
<b>Northern Plateau:</b>										
Boisé City, Idaho.....	-27	1883	-12	1883	9	1882	17.5	1883	29	1878
Cœur d'Alene, Fort, Idaho.....	-29	1883	-31	1883	Zero.	1884	20	1882	23	1884
Lewiston, Idaho.....	-14.2	1883	17.8	1884	12	1880	30	1880	35	1881
Dayton, Wash.....	-23.5	1883	-24	1883	8	1880	21	1880	30	1881
Spokane Falls, Wash.....	-27.7	1883	-25.1	1883	7	1882	26	1881	29	1881
<b>North Pacific Coast:</b>										
Cauby, Fort, Wash.....	32.3	1884	16	1884	33.5	1884	40.9	1884	42.6	1884
Olympia, Wash.....	9	1883	2	1884	23	1880	28	1880	30	1883
Portland, Oreg.....	8	1875	7	1883	25.5	1880	28	1875	33	1878
Roseburg, Oreg.....	12	1883	3.3	1884	19	1880	29	1878	33	1880
<b>Middle Pacific Coast:</b>										
Cape Mendocino, Cal.....	31	1883	23.5	1884	36	1884	36	1883	38	1883
Red Bluff, Cal.....	19	1883	22	1884	28	1880	34.9	1883	37	1879
Sacramento, Cal.....	23	1883	21	1884	29	1880	30.8	1883	39	1880



*the Signal Service, United States Army, for each month and the year, &c.—Continued.*

June.		July.		August.		September.		October.		November.		December.		Lowest on record.	
°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
36	1883	37	1882	33	1883	21	1884	— 2	1881	— 26.5	1880	— 44.5	1884	— 44.5	1884
33	1880	42	1880, 1883	40	1882	28	1884	5	1880	— 16	1880	— 28	1884	— 32	1883
28	1876	37.6	1882	34	1876	23	1878	— 4	1878	— 20	1875	— 24	1879, 1880	— 38	1875
33	1876	45	1877, 1883	42	1876	21	1876	11	1878	— 10	1877	— 27	1879	— 29	1883
37	1883	42	1878	44	1876	28	1878	1	1878	— 18	1877	— 25	1876	— 29	1875
3	1882	16	1876	15	1882	6	1876	— 17	1878	— 30	1880	— 37	1878	— 37	1875, 1878, 1883
40.5	1883	52	1882	49.5	1882	35	1883	19	1883	— 1	1882	— 21.5	1884	— 22.7	1884
40	1879	50	1877	50	1880	30	1876	10	1878	— 7	1880	— 15	1876	— 20	1883
33	1883	57	1883	52	1884	40	1883	28	1883	17	1883	— 2.5	1884	— 4	1884
44	1880, 1882	49	1880	48	1880, 1882	37	1880	26	1880	— 5	1880	— 10	1879	— 12	1883
47	1879	56	1877, 1880	53	1880	44	1878	25	1878	— 4	1880	2	1879, 1880, 1884	— 9	1879
49	1879	60	1877, 1880	54	1880	45	1882	32	1878	12	1880	6	1880	— 1	1881
49	1881	58	1881	47	1882	37	1883	30	1880	6	1880	1	1880	Zero.	1881
46	1877	50	1877	51	1882	40	1882	29	1877	12	1880	8	1880	2	1881
33	1877, 1880	46	1873, 1880	40	1882	27	1880	16	1880	— 11	1880	— 13	1879	— 13	1879, 1883
50	1881	56	1880	52	1880	42	1880	28	1882	11	1880	— 5	1880	— 5	1880
36	1880, 1882	41	1879	41	1880	32	1880, 1882	19	1880	9	1880	— 8	1884	— 9	1880
51	1882	56	1880	55	1882	47	1881	33	1881	20	1880	18	1880	10	1883
43	1879	62	1878, 1880	52.8	1884	39.1	1884	33.6	1883	24	1880	18	1879	13.2	1883
33	1880	42	1879	38	1876	29	1881	18	1880	— 1	1880	— 18	1879	— 18	1879
43	1883	54	1883	55	1884	42	1882	29	1881, 1882	17	1881	13	1881	16	1882
45	1880	53	1880	49	1880	42.9	1884	26	1880	16	1880	17	1884	10	1884
42	1884	48	1879	49	1884	34	1881	27.3	1881	8	1880	6	1879	1.4	1883
45.5	1884	40	1878	48.5	1884	41	1884	23	1877	19	1880	12	1878	10.8	1882
56	1878	61	1879	64	1879	50	1882	41.4	1883	31	1880	27	1879	22.5	1883
29	1880	37	1877, 1878	32	1880	23	1880, 1881	10	1878	— 9	1880	— 20	1879	— 23	1882
37	1875	45	1880	44	1880	36	1881	23	1878	8	1880	— 10	1879	— 20	1882
36	1882	40	1883	39	1881	30	1881, 1882	19	1878	7	1880	— 7.3	1884	— 27	1882
38	1882	29	1884	37	1882	30	1882	17	1881	Zero.	1881	— 31	1884	— 29	1882
43	1880	43	1880, 1881, 1882	45	1882	34	1883	23	1881	13	1880	— 16	1879, 1884	— 17.8	1884
35.5	1882	37.4	1881	36	1882	29	1881	19	1881	5	1881	— 26	1884	— 26	1884
39	1882	42.8	1884	38	1881, 1882	31	1881	13	1881	8	1881	— 17.6	1884	— 27.7	1882
47.6	1884	51	1884	50.6	1884	42.5	1884	40.2	1883	33.5	1883	21	1884	16	1884
36	1880	40	1882	41	1880, 1882	31	1877	23	1881	21	1882	8	1879, 1884	2	1884
39	1875	46	1875, 1880	43	1876	39	1875, 1877, 1882	31	1877	22.5	1880	3	1879	3	1875, 1879
37.5	1880	40	1879	40.5	1882	34.6	1881	22.5	1881	17.5	1880	7	1879	3.3	1884
43	1883	45	1882	46	1883	45	1882, 1884	42	1882	38	1882, 1883	34	1884	23.5	1884
47	1880	53	1881	52	1881	46.5	1884	32	1881	26	1880	25	1878, 1879, 1882, 1883, 1884	19	1883
43	1881	51	1879	49	1880	44.4	1882	34.4	1881	27	1880	23.5	1878	21	1884

*Lowest temperature (in degrees Fahrenheit) and year in which it occurred at stations of*

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
<b>Middle Pacific Coast—Continued:</b>										
San Francisco, Cal .....	36	1876	35	1883, 1884	39	1880	40	1875	45	1876, 1879, 1880, 1882
<b>South Pacific Coast:</b>										
Los Angeles, Cal .....	30	1880, 1883	28	1883	35.3	1882	39	1883	39.5	1883
San Diego, Cal .....	32	1880	35	1880	38	1880	39	1875	45.4	1883
<b>Alaska stations:</b>										
Alexander, Fort, Alaska .....	—18	1882	—26	1882	—6	1882	8	1882	23	1882
Atka, Alaska .....	20	1882, 1883, 1884	19	1882	15	1883	21	1884	24	1882
Hoonah, Alaska .....	3	1882	Zero.	1882	Zero.	1822	22	1884	29	1882
Pyramid Harbor, Alaska .....	—13	1882	—13	1882	—13	1882	14	1882	30	1882
Saint Michael's, Fort, Alaska .....	—47	1878	—52	1878	—39	1878	—27	1880	—2	1876, 1879
Sitka, Alaska .....	8.5	1882	4	1883	5.5	1882	25.5	1882	31	1881
Unalakha, Alaska .....	16	1884	7	1879	5	1883	15	1884	24	1882
Behring's Island, Behring Sea .....	6.8	1884	9.5	1884	12.2	1884	0.6	1884	27.4	1884

*the Signal Service, United States Army, for each month and the year, &c.—Continued.*

June.		July.		August.		September.		October.		November.		December.		Lowest on record.	
°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
48	1871, 1872, 1874	49	1874, 1881	50	1875, 1879, 1883	50	1874, 1880, 1881, 1883	45	1881	41	1880	34	1879	34	1879
47	1878	51.2	1881	50	1883	44	1880	42.5	1879	34.2	1881	30	1878, 1879	28	1883
50	1884	53.7	1884	54	1879, 1884	49.5	1882	44	1878	38	1881	32	1879	32	1879, 1880
32	1884	36	1884	30	1884	21	1884	9	1882	5	1884	—20	1881	—20	1881
30	1879	35	1882	39	1882, 1884	24	1884	28	1882	22	1882, 1883	12	1881	12	1881
35	1882	40	1882, 1883	38	1884	30	1883	25	1883	15	1883	1	1882	Zero.	1882
37	1882	43	1883	39	1882	32	1882, 1883	21	1882	9	1881	—9	1882	—18	1882
22	1881	33	1881	31.5	1884	18	1884	8	1879, 1880	—24	1876	—43	1880	—52	1878
38	1882, 1883	43	1881, 1882	42.5	1883	32	1884	26	1882, 1884	5	1883	9	1882	4	1882
34	1883	37	1881	36	1882	38	1883	24	1879	19	1883	12	1882	5	1883
31.8	1882	34.1	1883	33.2	1884	30.4	1884	19.2	1882	13.4	1884	1.4	1882	0.6	1884

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## APPENDIX 16.

*Monthly and annual mean temperatures (in degrees Fahrenheit) from reports made by voluntary observers of the Signal Service, United States Army, for the year ending December 31, 1884.*

[The daily mean is generally obtained by dividing the sum of the 7 a. m., 2, and twice the 9 p. m. (local time) observations by 4; the monthly, by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual mean.
Accotink, Va.	31.8	42.8	44.9	53.6	66.4	75.1	76.5	76.3	72.6	61.1	45.1	38.9	57.1
Aiken, S. C.	40.3	55.3	58.1	60.7	75.7	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	53.7	48.6	...
Albany, Oreg.	38.9	37.0	45.0	52.7	59.7	61.5	63.3	68.2	53.3	52.5	47.4	32.1	50.9
Allison, Kans.	30.4	20.8	35.3	44.5	57.1	71.0	74.3	68.0	68.5	54.0	34.5	16.9	46.9
Altoona, Pa.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	71.1	67.4	44.4	33.6	...
Amherst, Mass.	21.6	30.5	31.0	45.5	56.6	68.7	67.9	69.2	64.4	50.3	38.7	33.2	48.1
Andersonville, Ga.	41.7	( <sup>1</sup> )	60.0	64.0	74.4	( <sup>1</sup> )	79.3	81.7	77.1	49.5	( <sup>1</sup> )	( <sup>1</sup> )	...
Anna, Ill.	25.6	38.7	45.7	54.7	63.5	73.7	77.7	75.2	74.6	64.6	47.4	32.5	56.3
Ann Arbor, Mich.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	65.4	( <sup>1</sup> )	34.4	( <sup>1</sup> )	...
Archer, Fla.	52.0	65.6	68.2	69.0	80.3	79.1	81.9	79.5	77.7	73.9	62.0	63.1	71.1
Ardenia (Phillipstown), N. Y.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	73.5	( <sup>1</sup> )	66.5	62.4	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	...
Asheville, N. C.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	46.0	41.0	...
Ashwood, Tenn.	29.0	46.4	50.5	58.0	70.0	76.0	79.5	78.0	72.0	61.0	48.0	32.5	58.4
Atchison, Kans.	( <sup>1</sup> )	25.0	39.8	50.2	62.5	71.0	76.4	72.1	72.0	58.7	40.6	22.2	...
Athens, Ga.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	57.4	72.4	70.6	78.5	75.2	74.8	67.1	49.1	44.8	...
Auburn, N. Y.	17.5	28.0	30.0	43.3	58.5	69.0	66.5	63.2	64.5	51.6	38.7	30.7	47.2
Austin, Tenn.	28.2	47.0	49.0	55.7	68.6	( <sup>1</sup> )	77.6	78.8	75.8	65.7	46.1	41.5	...
Austin, Tex.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	73.9	82.7	88.3	84.8	88.2	70.8	58.0	49.5	...
Bainbridge Island, Wash.	39.0	34.0	43.0	51.3	52.0	60.0	62.2	( <sup>1</sup> )	54.0	61.1	47.2	( <sup>1</sup> )	...
Beloit, Wis.	10.2	20.1	29.4	44.7	57.9	66.5	68.5	66.5	66.4	52.0	32.2	18.7	44.4
Bloomington, Pa.	20.9	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	57.6	72.1	74.8	71.2	71.3	( <sup>1</sup> )	38.9	29.8	...
Blue Lake, Cal.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	60.3	61.7	69.7	55.6	55.0	50.9	41.1	...
Bowling Green, Ky.	26.4	( <sup>1</sup> )	44.8	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	74.6	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	42.7	( <sup>1</sup> )	...
Boyne, Mich.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	33.5	28.6	...
Brevard, N. C.	34.9	46.5	48.6	53.5	65.0	68.1	( <sup>1</sup> )	70.5	68.0	59.9	43.3	42.9	...
Bunker Hill, Ill.	18.8	31.0	39.8	50.6	61.9	70.9	73.8	70.1	71.4	57.2	( <sup>1</sup> )	21.7	...
Burlington, Vt.	13.5	25.0	29.9	43.8	55.8	70.7	( <sup>1</sup> )	( <sup>1</sup> )	65.2	48.7	36.1	26.8	...
Carson City, Nev.	30.2	26.0	38.8	46.1	57.5	61.2	69.6	68.0	55.8	48.6	38.7	35.6	48.0
Carthage, Mo.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	62.1	49.0	30.0	...
Catawissa, Pa.	21.2	30.8	32.2	50.0	62.0	66.5	71.8	69.0	67.2	55.0	40.8	31.8	49.8
Cedar Rapids (W.), Iowa.	8.9	17.6	25.4	43.5	57.7	67.8	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	20.1	...
Chambersburg, Pa.	23.1	32.8	38.9	47.4	58.6	( <sup>1</sup> )	70.1	69.7	66.6	53.5	36.1	31.5	...
Chapel Hill, N. C.	36.0	49.6	51.4	56.5	69.2	72.5	76.7	75.6	73.2	65.2	50.9	43.2	60.0
Charlotte, Vt.	11.0	22.5	26.5	42.5	56.8	68.0	67.9	62.5	69.0	48.2	34.8	23.8	44.5
Cincinnati (G. W. H.), Ohio.	27.0	39.0	43.6	52.4	67.4	75.0	75.8	74.9	78.6	61.0	48.4	34.6	55.7
Clarksville, Tex.	34.9	47.4	56.8	60.5	69.0	76.8	85.7	80.4	80.1	67.3	54.4	41.8	62.9
Clay Centre, Kans.	21.3	24.9	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	73.6	78.8	71.8	72.5	58.9	40.5	21.5	...
Cleburne, Tex.	( <sup>1</sup> )	47.0	57.2	60.0	68.3	75.2	84.2	85.0	81.1	65.7	51.1	38.2	...
Cleveland, Ohio.	20.1	30.7	34.4	44.6	58.5	69.0	68.9	67.9	( <sup>1</sup> )	55.1	39.3	30.9	...
Clinton, Ind.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	60.4	74.4	73.0	70.0	( <sup>1</sup> )	61.7	( <sup>1</sup> )	( <sup>1</sup> )	...
College City, Cal.	47.2	48.9	55.0	62.9	71.9	73.4	78.0	78.5	67.0	61.7	53.9	49.0	62.3
College Hill, Ohio.	23.0	38.4	42.3	52.3	64.0	74.9	70.4	70.0	73.6	62.3	46.2	31.8	54.1
Collinsville, Ill.	21.7	32.9	39.9	51.8	63.5	72.3	75.9	72.3	72.3	60.4	40.4	29.2	52.8
Conception, Mo.	12.7	22.8	35.6	48.1	58.0	71.8	74.6	68.2	66.7	56.8	40.7	18.2	48.0
Contoocook, N. H.	( <sup>1</sup> )	31.2	( <sup>1</sup> )	56.1	69.0	69.4	53.5	( <sup>1</sup> )	( <sup>1</sup> )	49.1	( <sup>1</sup> )	27.9	...
Cooperstown, N. Y.	17.7	27.5	28.3	40.8	54.0	65.7	64.5	66.5	61.6	48.3	36.0	27.0	44.8
Cornish, Me.	16.1	24.5	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	68.3	65.2	( <sup>1</sup> )	61.7	46.6	34.2	( <sup>1</sup> )	...
Cresco, Iowa.	5.5	11.8	25.3	43.2	56.0	67.1	66.3	65.2	63.3	49.0	28.6	10.2	40.9
Crete, Nebr.	16.2	19.5	34.6	46.0	59.4	69.4	73.2	68.7	67.7	55.7	36.5	14.1	46.8
Cumberland, Md.	26.6	36.4	40.8	49.0	61.4	68.7	70.5	69.9	68.6	56.8	41.9	33.2	52.0
Dale Enterprise, Va.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	71.5	72.0	70.8	59.2	41.3	34.2	...
Des Moines, Iowa.	14.4	19.5	33.3	49.3	59.4	69.1	( <sup>1</sup> )	( <sup>1</sup> )	67.9	55.7	35.8	16.4	...
De Soto, Nebr.	14.6	17.3	33.4	41.0	60.4	71.2	73.0	69.2	67.0	54.7	36.5	14.7	46.1
Dillingersville, Pa.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	62.0	69.2	57.2	( <sup>1</sup> )	70.7	51.6	( <sup>1</sup> )	( <sup>1</sup> )	...
Distributing Reservoir, D. C.	29.6	42.3	43.7	52.2	66.9	75.6	77.0	77.1	73.9	61.2	44.8	36.3	56.7
Dorset, Vt.	15.6	27.1	28.6	41.2	54.4	62.2	64.3	65.4	61.8	46.4	35.1	25.6	43.9
Drifton, Pa.	( <sup>1</sup> )	27.3	29.0	40.5	53.7	65.7	64.1	66.3	63.1	49.4	37.8	30.5	...

<sup>1</sup>No record.

Monthly and annual mean temperatures (in degrees Fahrenheit) from reports made by voluntary observers of the Signal Service, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual mean.
Dyberry, Pa.	17.8	27.9	29.5	41.7	55.8	66.8	65.2	65.6	60.8	49.0	35.2	27.5	45.2
Easton, Pa.	(1)	(1)	(1)	(1)	64.1	74.0	74.7	77.9	71.4	56.2	42.3	34.8	(1)
Elk Falls, Kans.	18.0	26.0	34.0	38.0	(1)	(1)	70.0	(1)	(1)	(1)	(1)	(1)	(1)
Embarra, Wis.	6.9	12.6	30.1	43.6	58.6	69.5	67.8	67.2	64.6	51.7	31.9	17.4	43.4
Emmittsburg, Md.	(1)	(1)	33.5	49.8	62.0	(1)	(1)	(1)	54.5	42.5	32.8	(1)	(1)
Emporia, Kans.	(1)	28.1	(1)	49.9	62.2	(1)	77.8	71.7	72.1	61.6	43.8	22.4	(1)
Eola, Oreg.	36.9	34.3	44.2	51.5	57.9	60.0	61.6	67.2	52.3	51.4	44.7	30.7	49.4
Factoryville, N. Y.	19.0	29.8	31.8	43.2	55.2	66.8	65.6	67.2	64.0	49.6	35.9	23.2	46.4
Fall Brook, Cal.	51.4	53.6	52.4	(1)	(1)	(1)	(1)	(1)	60.1	52.0	50.4	(1)	(1)
Fall River, Mass.	24.9	31.2	33.6	41.8	54.3	63.3	66.2	67.5	61.2	51.4	42.2	33.0	47.5
Fallsington, Pa.	25.1	37.1	39.9	49.5	61.2	70.5	71.9	71.9	69.6	54.6	40.6	32.9	52.2
Fallston, Md.	26.1	37.4	38.7	48.0	60.5	68.3	71.0	71.2	69.4	56.4	42.9	34.0	52.0
Fayetteville, Ark.	26.8	38.3	46.4	55.0	62.6	71.0	77.0	(1)	(1)	(1)	(1)	(1)	(1)
Forsyth, Ga.	(1)	56.3	(1)	62.9	74.5	74.2	81.4	79.5	82.2	73.8	56.3	49.3	(1)
Fort Collins, Colo.	23.4	(1)	35.0	45.8	58.3	(1)	76.8	(1)	(1)	48.7	34.7	(1)	(1)
Fort Scott, Kans.	22.2	32.2	(1)	55.5	65.1	76.0	83.9	74.4	(1)	(1)	(1)	(1)	(1)
Fort Wayne, Ind.	20.0	30.0	39.0	48.0	60.0	71.0	72.1	71.0	69.5	56.0	39.8	29.0	50.4
Frankfort, Ky.	23.9	41.6	(1)	52.7	64.0	72.8	(1)	72.1	71.4	60.2	(1)	35.3	(1)
Franklin, Pa.	15.8	28.1	30.4	(1)	52.2	63.4	61.5	61.5	61.5	47.2	32.5	25.2	(1)
Fremont, Nebr.	13.8	16.2	32.4	(1)	60.2	74.6	72.0	(1)	65.4	48.7	34.7	12.8	(1)
Gardiner, Me.	(1)	25.5	27.8	43.0	51.2	64.1	65.0	64.4	59.8	48.2	36.0	26.8	(1)
Garrettsville, Ohio	(1)	30.8	35.0	44.8	57.9	67.8	68.0	66.9	63.3	53.6	37.7	28.8	(1)
Genoa, Nebr.	14.2	14.1	31.8	44.0	59.8	71.8	73.3	69.5	61.2	54.8	36.0	12.0	45.2
Gramplan Hills, Pa.	17.0	28.0	30.7	41.0	53.5	65.9	66.6	68.0	66.0	51.7	35.7	25.6	46.8
Grand Coteau, La.	47.5	62.0	66.1	67.5	75.5	80.8	85.6	81.3	81.3	72.5	57.3	57.7	69.6
Grand Junction, Colo.	(1)	(1)	(1)	48.3	(1)	(1)	(1)	72.0	63.5	(1)	(1)	(1)	(1)
Great Falls Reservoir, Md.	(1)	(1)	40.8	49.5	63.9	72.7	74.6	74.0	70.8	59.0	43.9	36.6	(1)
Green Springs, Ala.	37.6	52.2	57.0	61.0	71.3	73.5	80.0	77.3	76.2	68.4	49.8	(1)	(1)
Guttenberg, Iowa	8.1	17.7	27.2	45.2	57.2	67.0	67.1	66.2	(1)	52.2	30.2	15.2	(1)
Hartford, Conn.	(1)	(1)	(1)	(1)	57.5	68.8	69.6	70.2	65.2	50.8	38.7	30.0	(1)
Helvetia, W. Va.	26.1	40.6	41.0	46.4	57.8	67.5	66.6	66.1	63.3	54.0	40.1	35.8	50.4
Highlands, N. C.	26.8	39.0	42.1	45.3	60.0	61.2	66.6	61.2	59.8	53.5	36.5	36.3	49.3
Hiram, Ohio	(1)	34.6	33.3	43.8	(1)	71.7	70.6	70.1	67.3	53.7	36.9	28.2	(1)
Holton, Kans.	19.0	23.0	42.0	(1)	(1)	(1)	(1)	(1)	(1)	(1)	41.0	21.0	(1)
Hudson, Mich.	15.1	27.2	(1)	(1)	(1)	68.9	69.8	64.8	66.2	53.1	33.7	24.3	(1)
Hulmeville, Pa.	24.6	35.6	(1)	(1)	62.7	70.1	71.9	74.0	(1)	(1)	(1)	(1)	(1)
Humboldt, Iowa	6.8	9.8	26.8	42.6	55.2	66.6	67.2	65.8	62.8	49.6	28.6	3.6	40.4
Humphrey, N. Y.	18.0	25.2	29.7	37.2	54.0	66.2	62.3	65.6	64.2	48.1	35.1	24.2	44.2
Hydesville, Cal.	46.2	44.4	48.5	51.7	55.8	59.0	58.4	59.8	57.6	55.6	54.5	(1)	(1)
Independence, Iowa	9.3	16.5	29.0	46.7	58.6	67.7	69.4	67.6	64.0	(1)	32.6	15.4	(1)
Independence, Kans.	22.0	31.0	44.1	52.5	63.8	73.1	74.3	72.8	73.9	60.8	45.6	25.4	53.6
Indianola, Iowa	15.1	20.3	35.4	49.3	61.2	70.0	72.0	69.7	67.8	55.9	37.5	18.0	47.7
Ionia, Mich.	16.0	22.7	30.6	43.8	56.4	68.0	67.4	65.4	64.3	50.6	34.6	24.7	45.4
Ithaca, N. Y.	19.5	28.6	30.4	41.5	56.0	68.9	66.0	68.6	64.6	50.9	37.5	29.2	46.8
Jacksonburg, Ohio	19.1	33.0	39.9	49.8	59.9	75.0	74.3	73.7	(1)	57.8	40.3	27.4	(1)
Jeffersonville, Ind.	(1)	39.1	44.6	53.2	64.3	73.3	75.0	72.9	68.5	60.6	49.6	34.2	(1)
Johnsontown, Va.	36.1	47.4	49.2	52.6	(1)	75.1	78.7	78.5	76.8	66.7	52.0	44.1	(1)
Kelley's (near Raleigh), N. C.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	78.0	73.0	66.9	51.0	45.9	(1)
Laconia, Ind.	23.0	39.7	44.0	52.8	64.2	70.3	75.3	72.5	71.5	60.5	44.2	33.6	54.3
Lafayette, Ind.	17.6	29.5	37.1	47.9	59.5	71.7	71.4	69.8	68.8	55.2	37.0	25.8	49.3
Lansing, Mich.	16.5	23.9	32.3	45.3	58.2	70.7	70.0	68.6	68.0	53.5	36.5	26.0	47.5
Lawrence, Kans.	21.0	28.0	41.6	45.8	62.2	71.1	(1)	(1)	70.4	57.9	41.5	23.5	(1)
Lead Hill, Ark.	25.8	38.1	48.7	56.7	67.8	76.4	81.6	76.2	76.4	63.2	47.4	29.1	57.3
Leetsdale, Pa.	21.9	33.0	35.9	45.5	59.5	69.3	69.0	66.7	60.2	48.3	37.2	29.5	48.2
Le Roy, N. Y.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	65.5	62.4	53.6	40.1	28.1	(1)
Limona, Pa.	(1)	63.6	(1)	71.0	78.9	78.7	81.4	80.5	79.3	74.9	70.8	65.9	(1)
Lincolnton, N. C.	(1)	(1)	(1)	(1)	69.8	76.7	73.5	73.5	70.6	67.1	36.3	37.4	(1)
Logan, Iowa	(1)	21.3	36.7	(1)	64.5	71.3	(1)	70.8	69.1	53.7	38.6	17.1	(1)
Logansport, Ind.	18.6	29.3	37.6	48.9	62.0	71.6	72.5	71.8	70.4	59.2	40.4	26.8	50.8
Lolling, La.	(1)	(1)	(1)	(1)	(1)	78.1	82.5	78.2	75.0	(1)	55.2	(1)	(1)
Lunenburg, Vt.	9.1	21.8	24.8	39.2	51.5	65.5	64.6	64.8	58.4	43.6	31.6	41.2	(1)
Madison, Nebr.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	67.4	(1)	40.4	15.0	(1)
Madison, Wis.	9.2	16.9	27.4	43.4	57.1	66.0	67.7	66.6	65.1	51.5	32.2	18.8	48.3
Manatee, Fla.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	81.4	78.9	71.2	69.8	(1)
Manchester, Iowa.	(1)	18.3	29.9	48.8	60.0	63.0	71.5	68.5	68.0	53.6	34.2	17.0	(1)
Manhattan (B), Kans.	(1)	24.4	39.5	51.0	63.1	(1)	73.8	73.6	74.8	69.4	(1)	(1)	(1)
Manistowic, Mich.	10.1	(1)	23.1	38.1	48.6	59.3	60.7	61.1	58.8	49.0	30.6	21.6	(1)
Manitowoc, Wis.	12.2	29.8	29.0	41.2	52.6	62.3	67.5	64.9	62.7	51.3	(1)	22.8	(1)
Margaretta Township, Ohio.	27.7	26.3	36.0	40.5	64.8	72.0	66.1	71.0	60.0	59.5	48.8	(1)	(1)
Marion, Va.	28.0	42.5	45.0	49.0	62.0	67.0	71.0	70.0	69.0	58.5	42.7	35.6	58.8
Marquette, Nebr.	21.2	22.4	(1)	51.2	67.1	80.0	80.2	78.3	(1)	(1)	(1)	19.8	(1)
Mattoon, Ill.	21.0	38.8	41.0	51.0	66.0	72.0	74.4	72.7	73.0	57.0	42.0	23.5	52.7
Maud, Kans.	(1)	(1)	(1)	50.6	(1)	(1)	(1)	(1)	76.9	(1)	(1)	(1)	(1)

<sup>1</sup> No record.

Monthly and annual mean temperatures (in degrees Fahrenheit) from reports made by voluntary observers of the Signal Service, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual mean.
Maynard, Iowa.....	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	52.8	64.0	64.2	62.5	61.4	47.6	28.5	18.7	°
Mayport, Fla.....	53.2	63.7	67.4	69.2	75.6	76.8	81.4	80.2	80.1	76.5	65.8	62.1	71.0
Mazatlan, Mex.....	66.8	70.8	( <sup>o</sup> )	70.8	75.8	82.8	83.4	82.5	82.4	79.4	75.7	72.1	°
McDonough, Md.....	( <sup>o</sup> )	36.8	38.9	49.4	56.2	70.5	69.9	71.5	65.9	( <sup>o</sup> )	41.4	33.9	°
Menand Station (near Albany), N. Y.....	17.9	28.4	31.5	45.5	57.4	70.4	68.6	70.9	66.1	51.4	38.5	27.5	47.8
Mendon, Mass.....	21.5	29.9	31.2	43.4	56.6	66.4	68.3	68.3	65.7	51.1	38.2	30.6	47.9
Milan, Tenn.....	23.6	44.0	48.7	56.0	66.2	72.4	77.2	74.8	73.8	62.3	45.5	37.4	57.2
Milledgeville, Ga.....	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	52.7	48.8	°
Milton, Mass.....	( <sup>o</sup> )	( <sup>o</sup> )	24.4	43.0	53.8	65.0	65.5	66.6	62.6	48.8	39.1	33.0	°
Minneapolis, Minn.....	8.8	8.8	22.6	43.2	57.0	67.8	( <sup>o</sup> )	67.2	61.0	48.4	27.0	8.6	°
Monticello, Iowa.....	9.4	18.1	29.2	46.6	58.6	68.2	70.1	67.6	66.6	51.8	32.0	15.8	44.5
Moorestown, N. J.....	25.6	36.6	38.6	47.8	60.4	69.0	72.1	71.4	68.8	55.4	41.2	23.0	51.7
Mountainville, N. Y.....	29.7	31.3	33.8	44.9	( <sup>o</sup> )	68.4	68.1	69.1	65.5	52.2	34.5	29.5	°
Mount Forest, Can.....	31.5	36.0	36.0	43.0	54.0	67.5	65.0	66.5	59.5	51.0	32.5	31.0	47.0
Mount Ida, Ark.....	32.5	43.2	50.5	57.3	65.5	75.3	81.0	75.3	75.5	63.0	49.0	38.2	58.8
Mount Vernon, Iowa.....	10.0	19.4	31.8	50.1	63.0	73.0	73.7	( <sup>o</sup> )	( <sup>o</sup> )	56.9	34.7	17.2	°
Muscatine, Iowa.....	10.4	21.1	32.5	46.9	57.8	66.7	69.8	66.9	67.3	55.8	35.8	19.3	45.8
Neillsville, Wis.....	1.8	8.5	22.0	38.4	52.0	63.3	61.5	59.4	57.0	43.7	22.0	6.9	36.4
Nephi, Utah.....	22.5	35.0	35.5	42.2	51.3	63.8	66.9	64.8	54.8	40.1	33.2	30.7	44.7
New Athens, Ohio.....	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	70.1	( <sup>o</sup> )	55.0	39.0	30.0	°
New Bedford, Mass.....	26.1	33.1	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	66.3	67.0	64.4	52.1	40.0	39.4	°
Newport, Fla.....	46.6	56.0	57.6	65.3	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	56.5	57.3	°
Newport, Vt.....	10.9	22.9	26.8	41.1	54.2	65.1	65.9	68.2	62.9	46.0	33.4	21.9	43.5
New Tacoma, Wash.....	( <sup>o</sup> )	( <sup>o</sup> )	43.0	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	66.7	55.0	( <sup>o</sup> )	45.7	29.0	°
New Ulm, Tex.....	44.0	56.3	63.4	63.5	72.2	79.0	84.2	82.6	80.0	69.5	57.9	( <sup>o</sup> )	°
North Colebrook, Conn.....	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	34.9	27.3	°
Northfield, Minn.....	( <sup>o</sup> )	( <sup>o</sup> )	24.7	43.0	57.2	71.0	67.4	62.2	61.6	49.3	28.7	10.1	°
North Lewisburg, Ohio.....	15.8	38.0	37.8	48.5	61.5	72.6	72.3	71.0	60.5	39.2	29.9	51.5	°
Northport, Mich.....	15.0	22.5	25.5	42.0	56.0	68.1	68.0	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	°
North Volney, N. Y.....	16.8	26.3	28.6	40.4	( <sup>o</sup> )	67.4	64.9	68.5	65.5	50.2	35.9	26.5	°
Oakland, Cal.....	47.0	48.3	53.2	54.3	59.3	69.8	63.4	61.5	59.4	56.4	55.4	51.2	55.8
Orono, Me.....	12.1	22.4	27.1	42.5	50.0	64.8	64.2	66.1	58.9	45.3	37.1	23.6	42.8
Ottumwa, Iowa.....	( <sup>o</sup> )	( <sup>o</sup> )	32.8	49.6	61.4	73.3	74.0	69.2	68.6	50.7	36.8	18.9	°
Palermo, N. Y.....	14.1	23.8	26.6	38.3	52.4	65.1	62.9	66.1	62.0	47.8	33.6	23.5	43.0
Paramaribo (Dutch Guiana), S. A.....	77.5	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	77.8	78.2	78.4	79.9	80.0	81.1	80.3	78.4	°
Paterson, N. J.....	26.0	35.0	38.0	48.0	60.0	( <sup>o</sup> )	70.0	( <sup>o</sup> )	68.0	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	°
Peoria, Ill.....	17.7	29.2	38.3	51.9	63.9	73.0	75.7	74.3	73.3	59.1	41.6	27.3	52.1
Phillipsburg, N. J.....	( <sup>o</sup> )	36.5	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	73.9	74.4	73.6	69.9	55.6	( <sup>o</sup> )	32.4	°
Pierce City, Mo.....	28.1	34.8	44.9	52.9	63.4	70.7	75.6	71.4	72.9	( <sup>o</sup> )	( <sup>o</sup> )	29.2	°
Point Pleasant, La.....	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	79.5	77.3	68.6	52.0	48.9	°	°
Port Jervis, N. Y.....	20.4	30.1	31.8	45.2	57.7	68.4	68.5	70.1	62.9	48.7	36.7	28.0	47.4
Portsmouth, Ohio.....	22.3	40.9	42.5	51.6	62.0	71.1	72.2	74.5	69.3	58.1	42.4	33.9	53.5
Poway, Cal.....	50.5	( <sup>o</sup> )	53.8	56.6	61.6	63.2	69.7	72.5	65.0	59.5	54.6	50.0	°
Prairie du Chien, Wis.....	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	58.9	68.3	68.7	67.2	66.3	51.8	31.2	20.6	°
Princeton, Cal.....	46.8	46.9	53.5	( <sup>o</sup> )	66.3	67.7	74.7	76.9	67.4	63.0	56.4	50.0	°
Princeton, Mass.....	18.9	28.3	28.4	40.4	52.2	64.8	64.3	66.0	62.2	47.0	35.3	27.7	44.5
Providence, R. I.....	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	68.0	( <sup>o</sup> )	66.8	63.0	53.0	42.9	34.1	°
Pueblo, Colo.....	29.1	28.9	43.0	47.4	58.2	68.0	75.1	70.5	66.6	54.2	36.5	22.1	49.8
Puerto de Luna, N. Mex.....	( <sup>o</sup> )	( <sup>o</sup> )	49.3	( <sup>o</sup> )	63.6	74.4	82.3	78.0	( <sup>o</sup> )	58.7	45.1	36.8	°
Quakertown, Pa.....	22.6	32.3	34.2	46.1	57.6	66.5	67.6	77.5	( <sup>o</sup> )	( <sup>o</sup> )	40.0	30.4	°
Raleigh, N. C.....	28.0	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	69.0	( <sup>o</sup> )	( <sup>o</sup> )	77.0	78.0	70.0	( <sup>o</sup> )	44.5	°
Readington, N. J.....	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	64.0	73.0	74.0	76.4	73.9	59.8	45.7	38.0	°
Receiving Reservoir, D. C.....	29.3	41.8	43.2	52.1	66.4	75.5	77.3	77.0	74.0	61.2	45.8	37.3	56.9
Red Willow, Nebr.....	( <sup>o</sup> )	( <sup>o</sup> )	88.0	48.0	61.0	75.0	75.3	73.9	60.0	57.0	53.0	19.0	°
Richardton, Dak.....	( <sup>o</sup> )	( <sup>o</sup> )	20.8	37.1	55.0	64.4	64.4	64.5	54.6	46.2	30.1	3.2	°
Richmond, Ky.....	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	64.0	71.7	72.7	71.3	71.6	60.0	44.0	36.1	°
Riley, Ill.....	9.8	20.5	29.2	43.7	57.0	66.1	67.4	65.8	65.2	51.5	32.8	19.4	44.0
Ripon, Wis.....	9.0	15.1	28.0	42.7	56.5	67.8	66.6	65.7	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	°
Rock Creek Bridge, D. C.....	87.1	43.7	45.6	55.6	69.8	78.1	78.9	78.7	74.4	62.7	46.3	38.5	58.6
Rockford, Ill.....	10.8	21.5	29.2	46.6	59.6	67.4	69.2	67.4	66.9	53.2	34.4	21.4	46.8
Rowe, Mass.....	16.8	25.6	27.8	40.2	( <sup>o</sup> )	66.3	64.7	65.9	60.9	48.1	34.5	26.2	°
Ruggles, Ohio.....	19.9	32.7	34.1	44.4	50.7	67.6	67.6	66.6	64.6	53.6	37.3	28.5	39.5
Sacramento, Cal.....	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	( <sup>o</sup> )	56.8	51.3	45.9	°
Salina, Kans.....	22.9	25.2	40.8	49.6	62.4	75.6	79.6	74.8	77.3	( <sup>o</sup> )	42.0	23.2	°
Salinas City, Cal.....	46.3	49.1	52.7	53.9	58.2	59.2	59.5	58.5	57.0	50.6	( <sup>o</sup> )	47.6	°
Sandwich, Ill.....	( <sup>o</sup> )	24.9	33.7	( <sup>o</sup> )	60.8	70.5	71.8	70.8	69.9	55.1	35.6	21.6	°
Sherlock, Kans.....	( <sup>o</sup> )	( <sup>o</sup> )	44.4	49.4	60.3	75.1	81.8	77.0	71.3	59.2	41.0	15.9	°
Somerset, Mass.....	24.8	33.0	35.1	44.7	48.1	68.3	71.4	71.8	67.8	54.2	41.2	33.3	49.5
Somerville, N. J.....	23.4	33.6	36.4	47.8	60.6	71.3	71.7	72.6	69.6	54.8	40.0	32.4	51.1
Southington, Conn.....	20.8	20.5	32.5	44.4	56.8	67.2	68.5	68.9	64.7	50.7	36.8	29.4	46.8
South Orange, N. J.....	23.8	33.2	36.4	48.0	59.1	68.1	69.3	69.8	67.7	54.2	41.0	33.0	50.3

<sup>1</sup> No record.

Monthly and annual mean temperatures (in degrees Fahrenheit) from reports made by voluntary observers of the Signal Service, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual mean.
Spiceand, Ind.....	°	°	°	°	°	°	°	°	°	°	°	°	°
Springfield, Mo.....	(°)	(°)	(°)	(°)	60.6	71.2	72.2	70.0	70.1	55.9	58.5	57.2	60.8
Stateburg, S. C.....	57.0	48.0	52.5	61.0	69.5	71.0	78.5	75.5	72.0	65.0	51.0	42.5	60.8
Stateville, N. C.....	(°)	(°)	52.8	57.9	70.5	73.4	76.7	77.7	75.3	67.1	50.1	43.8	60.8
Sterling, Kans.....	(°)	(°)	(°)	(°)	(°)	(°)	77.5	70.0	(°)	(°)	(°)	19.1	60.8
Stockham, Nebr.....	28.2	(°)	45.0	56.0	71.2	81.0	87.3	80.6	77.3	68.4	54.2	25.2	60.8
Stratford, Vt.....	12.6	23.0	25.5	40.5	54.4	67.4	67.5	68.6	62.9	46.2	33.1	23.0	43.7
Summit, Vs.....	(°)	(°)	(°)	(°)	(°)	74.5	73.8	72.5	67.6	50.9	43.2	36.4	60.8
Sunman, Ind.....	20.2	35.1	44.4	49.3	63.8	75.1	76.0	74.7	71.7	57.0	39.5	30.3	53.1
Sussex, Wis.....	10.9	17.7	26.8	40.3	54.6	64.7	68.0	65.3	67.6	50.9	35.6	17.9	48.0
Swanwick, Ill.....	22.1	33.9	43.4	52.5	63.5	71.8	75.7	73.0	72.3	(°)	(°)	29.3	60.8
Swartz Creek, Mich.....	15.3	22.7	29.4	42.9	55.9	68.0	66.7	65.5	64.8	50.5	32.4	24.4	45.0
Sycamore, Ill.....	11.5	22.0	30.8	44.9	56.9	66.3	67.6	65.5	64.8	51.2	32.8	20.5	43.7
Tallahassee, Fla.....	(°)	(°)	(°)	(°)	(°)	(°)	81.5	81.2	(°)	68.5	56.0	49.0	60.8
Tamaqua, Pa.....	(°)	(°)	(°)	52.0	67.0	78.0	74.5	76.2	72.0	55.6	40.0	31.0	60.8
Taunton, Mass.....	24.6	36.3	35.3	45.0	55.7	65.3	68.0	68.7	65.6	52.8	41.4	34.0	49.4
Tecumseh, Nebr.....	(°)	(°)	(°)	(°)	(°)	71.9	78.0	73.3	72.3	62.3	41.0	19.7	60.8
Thorntonville, Mich.....	16.4	24.6	31.0	44.1	58.0	70.1	68.1	68.4	72.1	53.1	35.9	27.4	47.4
Topeka, Kans.....	19.6	28.8	42.5	51.3	62.3	77.0	77.3	71.3	73.9	56.0	44.0	23.3	52.5
Troy, Pa.....	(°)	(°)	31.0	35.5	(°)	61.8	65.0	66.2	63.0	48.1	35.6	28.0	60.8
Variety Mills, Va.....	30.5	43.4	44.5	52.1	(°)	69.3	72.7	71.3	68.9	56.1	43.4	38.1	60.8
Vermillion, Dak.....	(°)	(°)	(°)	45.0	64.5	(°)	(°)	(°)	(°)	(°)	35.0	(°)	60.8
Vevay, Ind.....	23.0	40.2	45.0	52.1	64.3	73.9	74.8	73.0	72.4	62.3	45.1	34.0	55.0
Vineland, N. J.....	28.1	40.2	41.4	(°)	64.9	(°)	75.3	72.9	69.5	58.2	43.2	37.7	60.8
Wabash, Ind.....	18.7	30.5	37.3	47.9	61.6	71.1	73.2	71.0	70.5	56.7	38.6	26.0	50.3
Wausau, Wis.....	(°)	10.7	24.3	40.5	55.1	65.1	64.5	63.2	60.5	47.7	26.9	14.1	60.8
Wauseon, Ohio.....	14.5	26.2	33.1	44.9	58.3	69.5	70.1	68.4	67.8	53.2	35.5	24.5	47.2
Webster, Dak.....	1.7	-0.3	18.8	29.3	57.6	76.6	73.1	71.3	62.2	52.3	34.9	9.1	40.6
Weldon, N. C.....	24.7	48.3	49.6	55.2	63.7	72.3	76.8	75.4	74.7	63.7	46.9	41.6	57.3
Wellington, Kans.....	23.9	26.6	41.0	50.7	60.3	71.5	78.4	70.1	74.5	60.6	42.9	23.1	52.0
Wellborough, Pa.....	19.1	13.3	(°)	43.6	58.0	68.3	66.7	67.2	63.5	51.2	39.0	30.0	60.8
Westborough, Mass.....	22.4	31.5	34.4	45.7	58.7	67.8	71.7	(°)	67.2	51.6	39.4	33.0	60.8
West Chester, Pa.....	24.3	35.1	36.9	46.7	69.4	69.1	70.0	69.6	68.6	54.6	41.2	32.9	51.5
Westerville, Ohio.....	17.4	33.5	36.9	47.4	59.0	69.9	72.0	68.5	66.8	58.9	38.2	29.3	49.4
West Leavenworth, Kans.....	(°)	(°)	(°)	(°)	(°)	(°)	(°)	73.0	70.0	58.0	41.5	(°)	60.8
Westmoreland, Kans.....	(°)	(°)	(°)	47.0	62.0	72.4	74.7	71.0	68.0	(°)	(°)	(°)	60.8
West Union, Iowa.....	(°)	(°)	(°)	(°)	(°)	(°)	(°)	(°)	(°)	(°)	30.0	13.8	60.8
White Plains, N. Y.....	24.9	33.8	36.8	47.7	58.6	69.3	70.6	72.5	67.9	55.2	43.1	34.3	51.6
Wilkesbarre, Pa.....	21.6	32.3	33.8	45.9	58.2	70.0	67.2	68.7	(°)	51.6	38.4	30.8	60.8
Williamstown, Mass.....	18.3	27.8	29.2	42.1	54.5	67.1	69.1	65.9	60.9	49.4	36.0	27.9	45.7
Wilton Centre, Ill.....	(°)	(°)	(°)	(°)	(°)	(°)	70.3	69.9	68.1	54.9	35.5	25.7	60.8
Woodstock, Md.....	27.6	39.3	39.9	52.9	65.0	71.0	72.3	72.0	70.0	55.5	41.8	33.7	53.4
Woodstock, Vt.....	11.1	24.4	26.7	42.0	54.2	66.2	65.0	66.9	(°)	45.9	32.7	21.8	60.8
Worcester, Mass.....	20.4	28.3	26.6	(°)	(°)	64.9	64.2	68.5	62.1	48.7	37.6	23.9	60.8
Wandotte, Kans.....	(°)	(°)	39.5	50.8	60.5	72.5	80.0	70.5	68.8	57.5	40.0	31.5	60.8
Wytheville, Va.....	29.2	43.1	45.2	48.6	62.7	65.9	69.9	68.0	65.5	58.4	42.7	33.2	53.2
Yates Centre, Kans.....	19.5	27.7	41.5	45.6	61.8	70.6	73.7	73.5	73.9	58.8	38.5	22.6	51.2
Yutan, Nebr.....	(°)	(°)	(°)	(°)	(°)	(°)	75.4	70.4	68.1	55.8	34.5	14.3	60.8

<sup>1</sup> No record.

## APPENDIX 17.

*Monthly maximum and minimum temperatures and annual range of temperature (in degrees Army, for the year end-*

*[From self-register*

Stations.	January.		February.		March.		April.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Accotink, Va.	52	0.4	73	12	69	10	80	33	92	50	96	54
Aiken, S. C.	69	8	76	18	80	23	89	38	90	54	(1)	(1)
Albany, Oreg.	59	24	66	8	66	31	80	40	88	46	88	52
Allison, Kans.	62	-17	60	-20	77	Zero.	84	27	92	32	95.5	54
Altoona, Pa.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Amherst, Mass.	40	-8	46	5	54	Zero.	70.3	31.2	85.2	37.6	92.5	52.2
Andersonville, Ga.	70	12	81	26	81	26	91.8	46.4	93	65	(1)	(1)
Anna, Ill.	65	-21	68	6	72	15	83	31	83	47	92	55
Ann Arbor, Mich.	51	-16.6	(1)	(1)	(1)	(1)	68.5	30	(1)	(1)	(1)	(1)
Archer, Fla.	79	21	86	36	93	36	90	44	95	61	90	63
Ardenia (Phillips'n), N. Y.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	88	30	93.5	47
Ashwood, Tenn.	66	8	70	1	76	25	82	34	88	52	94	58
Atchison, Kans.	63	-6	(1)	(1)	70	8	77	30	86	41	90	55
Athens, Ga.	(1)	(1)	(1)	(1)	(1)	(1)	87	33	89.5	50	90	52
Auburn, N. Y.	47	-14	50	-4	56	2	72	30.5	86	37	87	54
Austin, Tenn.	64	12	68	4	73	22	82	32	86	42	(1)	(1)
Austin, Tex.	76	20	(1)	(1)	84	32	87	41.5	92	49	96	64
Bainbridge Isl'd, Wash.	54	25	56	7	66	22	78	38	84	38	80	43
Bandon, Oreg.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	68	45
Beloit, Wis.	39	-27	38	-10	65	-9	79	28	79	32.5	86	43.5
Belvidere, N. J.	(1)	(1)	(1)	(1)	(1)	(1)	68	35	(1)	(1)	(1)	(1)
Bethel, Conn.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	88	26	(1)	(1)
Birmingham, Ala.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Blacksburg, Va.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Blooming Grove, Pa.	46	-6	55	-4	60	-3	76	28	88	42	88	50
Blue Lake, Cal.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	80	43
Bowling Green, Ky.	63	-8	69	8	74	6	(1)	(1)	(1)	(1)	(1)	(1)
Boyne, Mich.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Brevard, N. C.	60	3	71	11	74	11	84	28	88	40	94	44
Bunker Hill, Ill.	63	-27	62	-1	72	5	84	31	86	38	95.1	50.3
Burlington, Vt.	46	-14	49	-19	56	-5.3	72.3	24.5	81.8	35.5	88.5	42.4
Carson City, Nev.	56	-5.5	52	-18	60	21	71	27	82	32	89.5	36.5
Carthage, Mo.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Catawissa, Pa.	48	-5	62	Zero.	65	Zero.	76.5	31.5	80.5	35.5	89.5	43.5
Cedar Rapids, (W.) Iowa	39	-34	44	-14	67	-10	80	23	80	33	88	43
Cedar Rapids, Iowa.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Chambersburg, Pa.	45	-4	52	4	65	8	76	32	91	38	90	56
Chapel Hill, N. C.	61	Zero.	76	16	80	16	88	35	94	43	98.5	41
Charlotte, Vt.	39	-16	48	3	52	-12	73	26	82	38	91	48
Chester, Minn.	39	-38	40	-24	63	-18	70	21	81	35	89	51
Cincinnati (G. W. H.) Ohio	57	-20	70	-2	76	9	83	33	93	46	98	60
Clarksville, Texas	71	3	75	10	79	30	84	34	83	50	93	56
Clay Centre, Kans.	60	-17	63	-9	(1)	(1)	(1)	(1)	(1)	(1)	95	55
Cleburne, Tex.	72	1	78	16	84	28	90	32	92	46	96	58
Cleveland, Ohio	50	-8.5	62	-1	63	3	74	26.5	80	36	86	51
Clinton, Ind.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	94	50
College City, Cal.	67	28	76	26	78	36	82	47	94	58	96	55
College Hill, Ohio.	54	-19	60	-2	70	4	(1)	32	90	40	96	61
Collinsville, Ill.	64	-23	61	3	70	8	81.5	32	85	43	93	52
Conception, Mo.	47	-31.5	53	-9.7	68	0.5	73	25	80	35	85.1	57
Contoocook, N. H.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Cooperstown, N. Y.	45	-10	46	-1	49	Zero.	68	27	84	34	85	54
Cornish, Me.	38	-11	47	3	56	-4	(1)	(1)	83	38	92	46
Cresco, Iowa.	38	-33	36	-18	66	-16	73	20	78	35	87	53
Crete, Nebr.	45	-25.3	57	-16	73	-4.6	80.6	24.5	87.8	32.2	91	44.8
Cumberland, Md.	54	-2	62	3	65	9	76	20	85	40	85	50
Dale Enterprise, Va.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Des Moines, Iowa.	50	-31.3	51	-8	72	-8	77	23	80	41	86	54
De Soto, Nebr.	46	-24	53	-14	69	-4	75	25	84	32	94	45
Dillingersville, Pa.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	87	40	95	50
Distributing Reservoir, D. C.	48	5	71	12	65	14	76	34	90	45	93	55
Dorset, Vt.	47	-19.5	57	-1	53	-9	70.8	12	82.5	29.8	87	38.5
Drifton, Pa.	(1)	(1)	56	-8	65	-8	73	24	88	32	92	41

<sup>1</sup> No record



## APPENDIX 17.

*Fahrenheit)* from reports made by voluntary observers of the Signal Service, United States  
ing December 31, 1884.

ing thermometers.]

July.		August.		September.		October.		November.		December.		Annual range.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
°	°	°	°	°	°	°	°	°	°	°	°	°
100	64	96	61	95	45	98	31	74	23	68	6	99.6
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....
96	54	96	52	74	44	72	34	66	26	58	6	90
101	57	95	48	97	32	89	19	80	4	69	-22.5	123.5
(1)	(1)	(1)	(1)	91	41	84	26	62	21.5	60	-0.5	.....
92	57.1	92.4	48.8	90	39	78	26	61	20	57	-10	103
98.5	60	98.7	69.5	96.7	68	72	30	(1)	(1)	(1)	(1)	.....
98	65	92	56	98	53	89	32	71	16	67	-7	114
(1)	(1)	(1)	(1)	80.1	43	(1)	(1)	58	12	(1)	(1)	.....
91	71	90	71	89	65	91	51	82	31	78	31	74
95	46	94	41	95	34	(1)	(1)	(1)	(1)	(1)	(1)	.....
94	65	98	58	92	48	94	28	72	24	62	3	97
97	62	91	54	92	49	88	30	68	8	60	-8	.....
93	63	92	59	92	45	94	30.5	70	24	69	15	.....
84.5	51	87	46	86	37	77	32	68	20	58	-17	104
96	62	95	56	92	52	94	30	70	26	68	3	.....
101	75	98	70	94	71	88	50	77	38	74	27	.....
80	50	(1)	(1)	70	39	65	33	62	31	(1)	(1)	.....
69	46	73	46	(1)	(1)	(1)	(1)	61	33	(1)	(1)	.....
90.5	49	90	45	92	42	84	24	62.5	-1.5	62	-19	119
82	67	(1)	(1)	84	59	76	39	(1)	(1)	(1)	(1)	.....
(1)	(1)	(1)	(1)	88	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....
(1)	(1)	(1)	(1)	(1)	(1)	92	30	79	26	69	10	.....
(1)	(1)	(1)	(1)	88	35	88	23	69	13.5	64	-4	.....
90	52	95	53	93	39	(1)	(1)	62	17	62	0.2	.....
87	40	88	45	76	36	73	32	69	33	59	23	.....
91.4	54.9	(1)	(1)	(1)	(1)	(1)	(1)	68	18	(1)	(1)	.....
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	65	11	51	-17	.....
(1)	(1)	90	54	89	42	92	25	79	26	66	10	.....
96	52	98	45	101	44	91	28	76	13	63	-12	123
(1)	(1)	(1)	(1)	91	36	75	39	57	17	54.3	-17.3	.....
94	38	95	39.5	88	28	77	32.5	66	14	64	4	113
(1)	(1)	(1)	(1)	(1)	(1)	87	35	73	18	67	-5	.....
91.5	52	93	45	93	43	82	28	64	17	65	-1.5	98
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	64	-5	50	-32	.....
(1)	(1)	(1)	(1)	(1)	(1)	86	34	61	Zero.	49	-22	.....
92	58	95	52	98	39	84	30	64	17	60	3	99
100	56.5	99	56	99	49	100	30	79	26	78	7	100
93	53	98	54	92	40	72	29	58	10	52	-16	114
90	51	88	50	93	35	82	17	57	-22	41	-36	131
94	57	98	56	96	53	92	29	66	15	65	-2	118
94	76	101	66	96	62	90	45	76	28	72	16	98
104	65	96	55	98	53	87	31	82	9	62	-9	.....
98	72	98	56	96	66	89	41	80	24	76	8	97
87.5	49.6	85	48	87	42	82	30	64.5	15.5	60	-8.5	97.5
93	59	90	48	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....
101	63	105	55	94	48	86	48	78	32	70	20	85
90.5	56	92	51	98	52	96	41	65	22	60	-6	.....
96	59	94	48	94	49	87	32	75	14	62	-10	119
93	56	89	52	87.1	48.9	83	29	65	-0.7	53	-13	124
93	44	95	43	(1)	(1)	80	25	(1)	(1)	58	-17	.....
85	54	87	43	87	36	77	24	60	18	56	-22	109
92	55	91	47	90	36	78	26	57	16	54	-18	.....
88	52	85	51	89	40	83	17	50	-15	41	-30	123
95.6	52.4	93	48	92	42	85	26	69	2	59	-16.9	120.9
90	51	96	54	90	41	84	23	64	24	56	4	92
97	51	98	56	97	42	92	26	70	20	68	-3	.....
(1)	(1)	88	51	89	46	87	21	66	-3	53	-23	.....
96	55	91	46	91	39	86	25	65	3	50	-19	120
90	58	(1)	(1)	95	52	80	22	(1)	(1)	(1)	(1)	.....
94	62	96	60	95	46	89	34	74	24	67	7	93
86	39	93	35	87	32	76	22	59	16	54.5	-20	113
89	47	91	40	91	37	81	22	68	14	62	-8	.....

<sup>1</sup> No record.

*Monthly maximum and minimum temperatures and annual range of temperature (in degrees*

Stations.	January.		February.		March.		April.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Dudley, Mass.	47	0	0	0	0	0	0	0	0	0	0	0
Dyberry, Pa.	45	-16	45	-4	58	-6	71	21	90	27	91	36
Easton, Pa.	42	1	56	6	64	5	71	21	92	47	95	54
East Portland, Oreg.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	86	42	86	50
Elk Falls, Kans.	38	2	38	-4	50	26	56	32	(1)	(1)	68	51
Embarras, Wis.	46	-35	40	-30	62	-15	75	26	84	42	90	49
Emmitsburg, Md.	(1)	(1)	(1)	(1)	69	9	79	31	86	46	89	54
Emporia, Kans.	(1)	(1)	00	-4	(1)	(1)	80	28	84	38	92	52
Eola, Oreg.	57	16	60	3	62	25	75	41	86	43	82	52
Factoryville, N. Y.	47	-21	50	-1	57	Zero.	72	25	87	30	88	40
Fall Brook, Cal.	76	33	85	39	75	38	(1)	(1)	(1)	(1)	(1)	(1)
Fall River, Mass.	48	1	52	4	62	3	65	26	78	33	90	40
Fallsington, Pa.	47	-3	64	8	63	8	73	33	87	46	93	53
Fallston, Md.	47	-4	65	9	60	8	71	30	85	40	92	49
Fayetteville, Ark.	67	-19	67	5	73	14	78	32	85	40	90	46
Flat Rock, N. C.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Forayth, Ga.	72	6	78	20	80	26	(1)	(1)	92	56	92	63
Fort Collins, Colo.	52	-11	(1)	(1)	58	12	71	12	78	31	(1)	(1)
Fort Madison, Iowa	40	-30	44	3	67	1	83	28	82	44	91	56
Fort Scott, Kans.	64	-24	64	1	78	17	80	31	86	42	95	58
Fort Wayne, Ind.	52	-18	57	-7	70	3	80	30	82	40	95	55
Frankfort, Ky.	58	-19	60	4	(1)	(1)	83	25	86	42	92	52
Franklin, Pa.	42	-22	50	-12	60	-10	(1)	(1)	80	34	90	52
Freemont, Nebr.	47	-36	53	-23	70	9	79	24	87	29	96	47
Gardiner, Me.	44	-19	44	Zero.	48	-19	63	24	75	32	84	37
Garrettsville, Ohio	(1)	(1)	62	-6	62	10	76	27	82	30	92	40
Genoa, Nebr.	42	-36	56	-23	69	-11	77	23	86	39	95	45
Germantown, Pa.	40	-6	56	5	58	5	(1)	(1)	84	41	92	50
Grampian Hills, Pa.	42	-16	54	-8	54	-4	72	22	88	29	86	46
Grand Coteau, La.	76	20	78	28	80	38	81.9	39.8	85.2	58.1	96.2	65.5
Grand Junction, Colo.	(1)	(1)	(1)	(1)	(1)	(1)	76	32	(1)	(1)	(1)	(1)
Great Falls Reservoir, Md.	(1)	(1)	(1)	(1)	61	10	77	32	89	43	90	52
Green Springs, Ala.	67	-4	76	20	80	32	83	40	87	60	92	58
Guttenberg, Iowa	42	-38	38	-18	63	-12	86	26	84	34	90	50
Hartford, Conn.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	90	32.5	97	49.3
Haverford College, Pa.	40	-7	60	6	50	6	66	32	85	39.5	88	41
Heath, Mass.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	80	33	92	50
Holvetia, W. Va.	58	-7	68	-2	65	-8	78	25	88	36	96	40
Highlands, N. C.	50	-8	64	-4	69	10	76	22	80	44	90	52
Hillsdale, Mich.	49	-30	54	-7	60	-9	76	23	80	30	95	47
Hiram, Ohio.	(1)	(1)	60	-12	61	Zero.	67	29	(1)	(1)	89	56
Holton, Kans.	54	-34	59	-8	75	7	(1)	(1)	(1)	(1)	(1)	(1)
Hudson, Mich.	47	-30	55	-8	(1)	(1)	(1)	(1)	83	28	91	47
Hulmeville, Pa.	45	-8	62	8	(1)	(1)	(1)	(1)	85	38	96	50
Humboldt, Iowa	41	-33	44	-23	66	-10	70	27	80	26	86	36
Humphrey, N. Y.	37	-9	54	-15	49	-4	70	24	84	33	88	50
Hydeville, Cal.	65	-30	78	24	83	34	78	40	89	46	76	50
Independence, Iowa	39	-29	40	-10	68	-10	74	27	76	40	82	56
Independence, Kans.	62	-20	64	-1	75	16	78	23	91	35	99	60
Indianola, Iowa	47	-28	51	-8	69	-4	70.4	30	77	40	88	60
Ionia, Mich.	45	-24	50	-18	60	-8.5	78	26	78.5	31.5	89	44
Ithaca, N. Y.	44	-16	55	-4	56	-3.5	73	24	90	32	93.5	44
Jacksonburg, Ohio.	40	-28	64	4	68	Zero.	89	26	89	38	101	54
Jeffersonville, Ind.	(1)	(1)	70	11	74	10	82	32	88	43	90	54
Johnsontown, Va.	61	-4	75	19	72	19	79	37	(1)	(1)	91	58
Kalamazoo, Mich.	42	-10	49	-1	62	6	(1)	(1)	81	39	90	51
Kelley's (near Raleigh) N. C.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Kenewick, Wash.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Kiantone, N. Y.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Klamath Agency, Oreg.	(1)	(1)	(1)	(1)	(1)	(1)	78	21	(1)	(1)	95	37
Laconia, Ind.	60	-22	70	8	73	6	83	31	87	44	95	61
Lafayette, Ind.	55	-28	60	-4	70	-5	79	28	80	36	89	58
Lancaster, Wis.	(1)	(1)	(1)	(1)	67	-17	(1)	(1)	78	31	86	41
Lansing, Mich.	47	-18	56	-13	64	-9	76	25	82	34	89	47
Lawrence, Kans.	57	-21.5	57	-1	73	12	76.5	28.5	85	36	92	48
Lead Hill, Ark.	60	-16	73	Zero.	79	17	87	28	93	46	100	51
Leetdale, Pa.	52	-12	65	Zero.	66	1	77.2	22	86.5	31.8	90	47.9
Lenoir, N. C.	54	3	66	11	70	12	(1)	(1)	74	(1)	86	45
Le Roy, N. Y.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Liberty Hill, La.	71	13	71	22	77	48	79	53	83	68	94	72
Limona, Fla.	82	28	86	40	91	88	95	47	98	62	100	63
Lincolnton, N. C.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	86	61
Logan, Iowa	48	-28	56	-10	70	-4	(1)	(1)	84	41	94	44
L'Anse-au-Loup, Ind.	60	-24	60	-5	72	-4	88	26	84	40	92	58
Luling, La.	78	18	(1)	(1)	(1)	(1)	75	41	(1)	(1)	90	64
Lunenburg, Va.	46	-23	45	-4	50	-12	68	30	78	35	86	40

<sup>1</sup> No record.

*Fahrenheit*) from reports made by voluntary observers of the Signal Service, &c.—Continued.

July.		August.		September.		October.		November.		December.		Annual range.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
88	55	90	63	93	42	80	25	(1)	(1)	(1)	(1)	.....
89	48	90	34	90	31	76	22	58	17	56	-15	107
96	61	98	62	98	46	88	36	62	30	70	4	.....
96	62	94	50	70	42	68	38	(1)	(1)	(1)	54	8
78	56	(1)	62	73	50	65	44	51	15	(1)	(1)	.....
85	56	86	52	85	46	85	25	62	-10	46	-30	125
98.7	58.5	(1)	51	86	51	86	31	65	24	60	-4	.....
80	54	92	56	68	40	68	87	59	30	49	8	89
86	45	93	36	92	38	80	22	58	14	53	-12	114
(1)	(1)	(1)	(1)	(1)	(1)	92	40	90	40	78	34	.....
83	53	63	47	89	45	79	27	63	22	58	-10	100
91.5	62	93	56	92	48	81	31	62	20	62	Zero.	96
93	54	91	52	93	45	83	29	67	23	61	Zero.	93
92.5	50	88	50	92	53	85	32	(1)	(1)	(1)	(1)	.....
(1)	(1)	82	56	83	41.5	84	30	65	22	(1)	(1)	.....
94	72	86	68	90	62	100	38	78	30	73	16	.....
102	61	(1)	(1)	(1)	(1)	84	15	67	15	67	-11	.....
95	62	92	58	91	49	85	27	80	10	50	-12	125
98	64	95	60	94	54	90	32	(1)	(1)	47	-2	.....
94	53	96	52	96	44	93	30	68	10	58	-12	116
(1)	(1)	98	49	90	50	89	27	(1)	(1)	65	-6	.....
88	46	88	46	88	33	80	20	61	12	53	-12	.....
98	50	(1)	(1)	94	44	83	25	58	1	55	-24	.....
83	48	83	45	83	34	74	28	57	16	59	-18	103
91	45	91	47	90	37	86	29	68	14	63	-8	.....
98	52	91	49	89	44	86	24	67	-1	63	-24	126
90	57	92	50	92	48	80	31	(1)	(1)	58	0.2	.....
94	50	94	50	94	36	80	22	60	10	58	-12	110
98	68	96	67	93	63	89	46	76	84	75	25	78
(1)	(1)	104	52	95	38	(1)	(1)	(1)	(1)	(1)	(1)	.....
94	56	92	58	96	46	90	28	70	24	68	11	.....
95	70	96	64	93	57	93	34	74	29	72	12	92
97	54	90	48	94	40	88	22	62	-8	44	-24	132
95	54	96	42	94	33	81	24	64	18	59	-12	.....
88	59	88	59	90	43	82	30	62	18	63	-1	91
90	52	(1)	(1)	92	34	74	22	(1)	(1)	50	(1)	.....
92	42	90	48	92	40	88	26	67	20	65	-6	103
85	55	82	52	78	40	83	18	62	19	55	9	93
89	47	93	39	93	38	83	23	60	7	54	-19	115
85	59	90	55	91	49	82	29	60	10.5	69	-4.5	.....
(1)	(1)	(1)	(1)	(1)	(1)	90	26	73	10	62	-10	.....
90	47	96	40	95	32	86	21	61	5	53	-28	.....
94	60	95	48	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....
90	50	88	48	89	44	84	18	61	-2	48	-29	123
88	56	90	48	87	39	79	24	58	10	58	-18	105
76	50	80	30	76	42	76	40	70	40	(1)	(1)	.....
85	58	84	56	84	48	78	26	54	Zero.	43	-22	114
100	55	96	53	94	53	91	32	73	16	64	-8	120
92	60	88	55	88	47	84	26	65	4	53	-16	120
90	44	92	39	92	35	83	25	59	8	51.5	-23.5	116
91	48	91	39	90	34	83	22	60	15	58	-30	113.5
100	54	99	44	(1)	(1)	95	28	52	10	58	-8	.....
94	58	92	53	90	50	88	28	67	17	62	-7.5	.....
95	69	91	67	92	59	94	37	78	20	70	12	.....
90	51	92	44	95	49	81	32	60	13	49	-9	.....
(1)	(1)	92	66	87	59	91	30	77	26	74	8	.....
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	56	24	43	-26	.....
98	35	96	30	(1)	(1)	76	26	(1)	(1)	(1)	(1)	.....
95	58	93	51	53	50	89	37	67	16	63	-9	118
88	60	89	54	91	36	86	35	65	7	58	-31	122
(1)	(1)	89.5	40	(1)	(1)	84	17	61	-9	45	-30	.....
88	50	93	55	93	43	85	27	63	9	55	-22	115
(1)	(1)	(1)	(1)	92	48	85	31	70	10	59.5	-6.5	.....
105	62	100	52	103	51	97	31	96	16	67	4	120
95.2	45.7	92	46	92	36	75	23	70	14	62.5	6.5	107.2
96	56	96	61	89	45	80	30	68	23	64	10	.....
95	46	94	41	95	34	84	21	68	16	63	-8	.....
(1)	(1)	95	33	92	82	87	40	74	31	70	29	.....
96	73	96	71	94	69	93	52	85	41	84	34	72
89	68	77	70	85	53	83	42	(1)	36.3	83	33	.....
96	54	88	50	93	44	86	22	64	Zero.	54	-24	.....
89	52	98	51	96	43	90	30	70	10	62	-15	120
101	69	95	63	93	59	90	43	78	33	81	25	.....
86	50	87	40	84	35	70	25	50	10	50	-26	113

<sup>1</sup> No record.

Monthly maximum and minimum temperatures and annual range of temperature (in degrees

Stations.	January.		February.		March.		April.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Madison, Nebr.....	0	0	0	0	0	0	0	0	0	0	0	0
Madison, Wis.....	42	(1)	37	(1)	61	(1)	76	(1)	78	(1)	86	(1)
Manatee, Fla.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Manchester, Iowa.....	(1)	(1)	48	(1)	68	(1)	80	(1)	83	(1)	90	(1)
Manhattan, (B), Kans.....	(1)	(1)	58	(1)	80	(1)	88	(1)	88	(1)	97	(1)
Manhattan, Kans.....	60	23	63	6	(1)	(1)	(1)	(1)	(1)	(1)	101	54
Manistique, Mich.....	43	21	37	26	62	26	65	17	79	28.5	83	39
Manitowoc, Wis.....	42	22	43	14	58	10	64	26	80	39	86	40
Margaretta Township, Ohio.....	50	16	46	6	57	5	72	31	69	48	86.2	56.2
Marion, Va.....	60	8	68	Zero.	72	8	78	27	82	41	90	52
Marquette, Nebr.....	43	22	50	3	66	10	78	32	81	41	89	67
Marshall, Mich.....	47	12	43	3	59	8	80	30	81	42	92	53
Mattoon, Ill.....	62	28	62	2	70	3	83	30	85	42	94	53
Maud, Kans.....	(1)	(1)	(1)	(1)	(1)	(1)	79	22	(1)	(1)	(1)	(1)
Maynard, Iowa.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	68	34	89	48
Mayport, Fla.....	75	27	82	41	86	43	86	55	89	69	90	70
Mazatlan, Mex.....	79	53	30.3	55.5	(1)	(1)	81.3	54	86	61.8	98	68
McDonogh, Md.....	(1)	(1)	68	7	62	3	72	33	84	41	87	49
Menand Station (near Albany), N. Y.....	46	10	48	5	53	4	72	32	84	30	90.5	55.5
Mendon, Mass.....	42	4	53	0.2	58	3	64	28	83	40	88	51
Mendon, Mich.....	48	21.5	(1)	(1)	(1)	(1)	(1)	(1)	82	41	97	46
Milan, Tenn.....	67	10	72	13	76	24	84	31	87	46	92	56
Milldegeville, Ga.....	(1)	(1)	(1)	(1)	79	21	(1)	(1)	88	50	88	52
Milton, Mass.....	46	4	56	1	59	1.5	68	26	85	38	90	44
Minneapolis, Minn.....	38	33	39	18	58	16	72	21	82	35	87	48
Monticello, Iowa.....	42	33	44	12	68	8	80	18	83	34	98	44
Moorestown, N. J.....	46	0.5	66	8	63	8	74	32	90	41	94	45
Mottville, Mich.....	49	24	55	7	60	5	81	28	78.2	34	89	50
Mountainville, N. Y.....	49	15	56	1	61	3	73	22	(1)	81	87	48
Mount Forest, Canada.....	40	23	41	11	49	23	68	18	77.5	(1)	87	58
Mount Ida, Ark.....	72	2	76	10	78	20	84	27	84	48	94	50
Mount Vernon, Iowa.....	45	35	48	8	65	8	84	25	88	41	94	53
Muscataine, Iowa.....	45	28	45	4	66	8	82	25	81	36	89	45
Nayatt Point, R. I.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Nellisville, Wis.....	36	36	35	25	55	24	69	18	75	29	89	36
Nepht, Utah.....	47	12	49	16	52	18	68	25	80	30	91	40
New Athens, Ohio.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
New Bedford, Mass.....	46	1	56	5	(1)	(1)	(1)	(1)	74	41	87	49
Newport, Fla.....	69	18	78	32	80	36	83	45	(1)	(1)	(1)	(1)
Newport, Vt.....	48	29	43	4	54	24	72	24	80	38	92	44
New Tacoma, Wash.....	55	25	(1)	(1)	61	23	(1)	(1)	(1)	(1)	76	52
New Ulm, Tex.....	78	13	70	22	84	33	86.5	40	79	61.5	95	62
North Colebrook, Conn.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Northfield, Minn.....	41	29	34	19	62	12	71	18	80	31	89	43
North Lewisburg, Ohio.....	49	23.5	59	4	65	2	78	27	84	34	94.5	50
Northport, Mich.....	37	4	43	2	56	3	70	28	76	37	86	52
North Volney, N. Y.....	41	6	45	3	53	2	74	26	(1)	(1)	89	52
Oakland, Cal.....	60	31	73	28	67	38	70	43	81	48	73	54
Ogreeta, N. C.....	50	2	61	11	70	19	66	40	72	57	77	66
Orono, Me.....	43	29	44	8.4	50	14	65.9	23.8	75.5	34.1	88.6	38.2
Oskaloosa, Iowa.....	34	29	(1)	(1)	65	4	(1)	(1)	80	38	89	55
Ottumwa, Iowa.....	49	3.5	(1)	(1)	71	2	79.6	27.4	83	38	90	54.5
Palermo, N. Y.....	40	10	43	Zero.	49	Zero.	71	25	85	33	89	54
Paramaribo (Dutch Guiana), S. A.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	38.6	66	89	70
Paterson, N. J.....	49	Zero.	53	5	69	6	72	33	87	40	(1)	(1)
Peoria, Ill.....	48	27	49	5	67	Zero.	85	31	84	44	94	50
Phillipsburg, N. J.....	42	10	58	2	64	4	(1)	(1)	(1)	(1)	92	54
Pierce City, Mo.....	62	9	70	6	73	18	80	28	89	35	92	48
Pleasant Grove, Wash.....	(1)	(1)	(1)	(1)	63	3	75	29	85	32	89	36
Point Pleasant, La.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Port Jervis, N. Y.....	38	3	50	2	57	1	(1)	(1)	87	39	92	52
Portsmouth, Ohio.....	58	16	68	5	59	8	84.5	32	90	41	93	53.5
Poway, Cal.....	76	31	(1)	(1)	71	40	74	43	79	52	97	56
Prairie du Chien, Wis.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	83	42	89	56
Princeton, Cal.....	65	28	75	23	74	37	75	38	89	46	92	53
Princeton, Mass.....	40	6.5	53	2	50	3	63	20	81.5	27	89.7	41
Providence, R. I.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	87.5	32	95	40
Pueblo, Colo.....	60	11	66	13	70	16	74	30	83	38	90	54
Puerto de Luna, N. Mex.....	(1)	(1)	(1)	(1)	81	19	(1)	(1)	90	43	101	61
Quakertown, Pa.....	42	2	52	2	59	2	68	28	81	37	88	41
Quitman, Ga.....	70	17	(1)	(1)	82	41	(1)	(1)	(1)	(1)	(1)	(1)
Raleigh, N. C.....	63	3	(1)	(1)	(1)	(1)	(1)	(1)	85	50	(1)	(1)
Readington, N. J.....	44	Zero.	54	16	62	6	76	36	90	46	100	53
Receiving Reservoir, D. C.....	51	4	72	10	67	13	88	33	92	44	94	53

(1) No record.

(Fahrenheit) from reports made by voluntary observers of the Signal Service, &c.—Continued.

July.		August.		September.		October.		November.		December.		Annual range.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
°	°	°	°	°	°	°	°	°	°	°	°	°
( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	87	42	( <sup>1</sup> )	( <sup>1</sup> )	73	2	64	-22	113.2
85	52	84.9	49.4	86	47	80	26	60	-5	43	-20	113.2
( <sup>1</sup> )	( <sup>1</sup> )	92	65	92	72	84	61	86	50	86	43	113.2
96	54	90	46	94	45	85	24	62	-4	50	-21	113.2
103	57	100	54	102	52	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	113.2
103	57	100	54	102	52	90	30	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	113.2
82	41	84	35	88	35	81	19	62	-1	48	-19	114
85	46	84	45	85	42	84	24	( <sup>1</sup> )	( <sup>1</sup> )	47	-21	114
80	64	92	51	90	46	83	31	49	17	61	-15	108
88	50	88	56	89	42	88	24	66	20	66	-2	98
92	71	90	66	88	56	83	35	60	-14	57	-14	114
87	60	93	43	94	43	84	32	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	114
97	59	98	50	99	54	98	30	73	11	94	-13	127
( <sup>1</sup> )	( <sup>1</sup> )	94	58	96	50	88	( <sup>1</sup> )	73	9	60	-12	127
88	50	87	48	90	34	81	16	58	-14	46	-30	127
95	76	91	73	90	72	87	61	77	48	90	40	68
92.2	66	94	66	92	65	90	60	86	61	82	55	68
89	( <sup>1</sup> )	87	58	89	44	87	28	67	20	62	-1	68
88	57	91.7	50	88	46	76	31	59	20.5	53	-30	111.7
86	56	87	55	87	44	78	29	64	8	57	-10	98
97	45	93	41	98	44	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	98
95	64	99	54	97	50	93	27	75	31	65	5	100
94	64	92	61	89	51	94	35	78	26	71	18	100
85	54	85	50	86	40	78	32	63	19	68	-12	102
( <sup>1</sup> )	( <sup>1</sup> )	90	51	87	47	90	18	59	-13	46	-32	102
92	50	90	45	90	30	85	17	63	-3	48	-24	126
92	62	93	46	94	47	83	30	64	17	64	-2	96
87	56	90	45	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	96
94	53	95	42	94	35	84	20.5	63	17	62	-14	96
84	46	90	43	88	31	76	26	54	11	44.5	-18	113
100	60	102	52	95	52	89	32	76	18	70	15	105
89	62	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	87	23	67	Zero.	48	-24	122
90.7	53	92	43.5	94	41	87	24	68	5	54	-19	122
( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	96	44	85	32	62	26	66	-10	122
82	39	89	37	90	29	74	13	48	-23	37	-38	128
92	47	93	40	85	28	77	23	63	16	50	-7	108
( <sup>1</sup> )	( <sup>1</sup> )	91	49	90	38	83	25	64	16	59	-9	108
81	56	81	52	87	43	78	29	56.5	32	55	-10	108
( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	78.6	34	74.4	-37	121
91	48	92	42	90	30	76	28	54	9	50	-23	121
76	51	89	52	69	42	( <sup>1</sup> )	( <sup>1</sup> )	61	29	51	7	121
100	73	86	79	83.9	74	90	50	80	30	( <sup>1</sup> )	( <sup>1</sup> )	121
( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	58	11	57	-20	124
88	44	87	50	90	41	82	18	60	-12	45	-38	128
90	52	92	48	96	37	87	25	64	11	56	-20	119.5
86	59	92	54	90	54	80	30	58	10	48	2	96
85	54	97	49	95	26	80	24	56	17	57	-15	96
88	53	78	54	76	47	75	41	70	42	63	30	60
79	61	80	62	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	118
84.1	49.1	89	44	88	30	78	28	58	9	59	-30	118
( <sup>1</sup> )	( <sup>1</sup> )	86	55	87	44	85	22	65	9	52	-20	118
94	60	92	57	96	42	91.8	27	70.1	6	56	-18	111
87	50	90	46	92	34	79	23	67	15	58	-19	111
89	69	91	70	92	70	95	70	94	69.5	92	69	124
90	80	( <sup>1</sup> )	( <sup>1</sup> )	93	49	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	56	-2	124
98	59	97	50	94	50	90	29	68	16	57	-10	124
92	59	92	49	90	49	78	31	60	23	64	-2	124
100	56	91	52	95	58	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	68	-1	124
91	43	95	37	75	22	70	17	56	15	46	-25	124
( <sup>1</sup> )	( <sup>1</sup> )	97	66	96	61	92	39	76	32	71	17	124
90	55	90	48	88	42	82	30	56	16	56	-7	124
94	48	93	51	92	44	89	26	70	20	53.5	-5.5	110
101	59	104	59	90	53	87	41	87	33	78	30	110
87	54	90	51	90	46	86	23	62	-6.9	46.8	-24.1	110
98	56	104	56	97	45	84	44	78	32	68	24	82
85.5	43.5	90	43	89	40	78	23	54	14	54	-18	108
( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	92	39	81	28	67	18.9	62.2	-11.5	108
96	63	91	54	89	44	80	23	67	16	60	-15	111
108	72	99	68	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	67	21	( <sup>1</sup> )	( <sup>1</sup> )	111
86	53	88	45	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	60	17	52	Zero.	111
( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	95	44	80	35	74	28	111
( <sup>1</sup> )	( <sup>1</sup> )	92	67	92	58	93	42	( <sup>1</sup> )	( <sup>1</sup> )	71	12	106
94	63	100	56	104	50	90	32	74	34	66	-2	106
96	62	94	59	98	46	92	30	71	27	67	14	94

(<sup>1</sup>) No record.

*Monthly maximum and minimum temperatures and annual range of temperature (in degrees*

Stations.	January.		February.		March.		April.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Red Willow, Nebr.....	49	-15	63	-14	77	Zero.	83	26	86	22	104	47
Richardton, Dak.....	38	-34	(1)	(1)	64	-17	71	13	76	30	88	51
Richmond, Ky.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	84	47	87.8	59
Riley, Ill.....	40	-31	38	-10.5	64	-10	77.3	25.5	78.5	32.6	87.1	45.8
Ripon, Wis.....	42	-30	38	-15.5	64	14	78	27	78	32	86	43
Rock Creek Bridge, D. C.	49	6	74	11	70	16	83	33	97	50	96	60
Rockford, Ill.....	41	-28	39	-9	64	-8	79	29	78	42	87	51
Round Grove, Iowa.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Rowe, Mass.....	46	-15	48	-2	54	-3	64	26	84	29	87	46
Ruggles, Ohio.....	45	-20	58	-4	66	Zero.	80	24	88	36	91	54
Sacramento, Cal.....	62	27	74	25	72	36	80	38	87	48	93	53
Salem, N. J.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	80	50	98	42
Salina, Kans.....	52	4	48	3	65	11	68	35.8	70	46	84.5	03
Salinas City, Cal.....	65	30	76	25	72	34	72.5	44.5	80.5	50	73	54
Sandwich, Ill.....	42	-6	(1)	(1)	66	-7	(1)	(1)	82	44	93	54
San Rafael, Cal.....	(1)	(1)	(1)	(1)	(1)	(1)	74	56	86	40	(1)	42
Sherlock, Kans.....	(1)	(1)	(1)	(1)	76	11	83.6	31.1	88.6	33	96.5	(1)
Snowville, Va.....	59	Zero.	68	4	69	9	(1)	(1)	82	38	88	43
Somerset, Mass.....	42	-7	53	2	69	2	76	26	89	32	98	42
Somerville, N. J.....	43	-7.5	55	0.5	62	3	69.2	33.5	88.5	46.2	94	53.5
Southington, Conn.....	49	-9	48	-1	64	-0.9	70	14	91	26	95	46
South Orange, N. J.....	44	4	58	4	64	4	76	32	88	40	92	46
Spice land, Ind.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	87	65
Springfield, Ark.....	61	-2	69	13	(1)	(1)	(1)	(1)	89	46	98	58
Springfield, Mo.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	89	46	98	53
Stateburg, S. C.....	66	8	75	21	77	28	84	38	86	53	89	48
State College, Pa.....	46	-5	54	-4	59	4	(1)	(1)	81	32	88	54
Statesville, N. C.....	(1)	(1)	71	16	78	16	82	36	90	51	93	(1)
Sterling, Kans.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	94	74
Stockham, Nebr.....	50	6	58	2	68	16	74	38	82	48	94	52
Stratford, Vt.....	42	-14	44	-2	46	-4	66	22	80	34	90	(1)
Summit, Va.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Sunman, Ind.....	51	-24	62	-6	70	Zero.	84	33	86	34	94	56
Sussex, Wis.....	39	-27	36	-16	62	-12	77	23	78	38	88	44
Swanwick, Ill.....	64	-22	63	2	68	10	80	36	83	46	91	53
Swartz Creek, Mich.....	49	-25	61	-16	57	-15	69	28	81	28	88	43
Sycamore, Ill.....	39	-28	36	-7	63	-7	77	28.8	78	43	89	52
Syracuse, N. Y.....	(1)	(1)	51	2	55	2	(1)	(1)	86	40	94	58
Tallahassee, Fla.....	74	13	(1)	(1)	84	40	82	52	91	62	86	65
Tamaqua, Pa.....	(1)	(1)	(1)	(1)	(1)	(1)	76	28	90	46	100	56
Taunton, Mass.....	51	3	54	3	65	4	71	26	85	31	95	34
Tecumseh, Nebr.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	96	60
Terre Haute, Ind.....	57	-21	63	-6	66	8	79	37	80	48	89	59
Thorville, Mich.....	47	-19	54	-12	60	-12	71	26	83	34	92	50
Topeka, Kans.....	59	-22.5	68	-5	75	10	77	31	86	30	96	58
Traverse City, Mich.....	39	-22	45	-19	54	-23	75	17	78	30	90	44
Troy, Pa.....	49	-22	56	-5	61	-2	68	20	86	26	92.5	35
Variety Mills, Va.....	50	-8.5	70	10	72	12	81.6	26.6	90.5	36.8	97.5	45.6
Vermillion, Dak.....	47	-34.5	53	-27	70	-10	73	22.5	84	29	(1)	(1)
Vevay, Ind.....	(1)	(1)	(1)	(1)	75	6	85	31	89	43	94	57
Vineland, N. J.....	52	4	67	10	68	13	(1)	(1)	92	42	(1)	(1)
Voluntown, Conn.....	50	-4	55	Zero.	64	-2	(1)	(1)	83	32	94	54
Wabash, Ind.....	54	-20	56	Zero.	67	1	76	32	81	40	91	56
Wauau, Wis.....	41	-32	36	-26	58	-25	70.5	20	79.5	30.5	89	39
Wauseon, Ohio.....	50	-31.7	58	-8.1	65	-7.5	78.6	21.5	82	29	92	48
Webster, Dak.....	39	-39	37	-33	54	-31	68	17	87	26	102	54
Weldon, N. C.....	61	Zero.	74	19	77	16	82	36	93	50	94	53
Wellington, Kans.....	58	-13	64	-5	77	13	91	27	87	88	95	53
Wellsborough, Pa.....	42	-24	48	-10	(1)	(1)	72	26	84	40	95	50
Westborough, Mass.....	46	-8	60	5	60	-3	65	28	93	87	100	35
West Chester, Pa.....	48	3	60	5	60	4	71.5	31	86	38	90.5	45
Westerville, Ohio.....	(1)	(1)	(1)	(1)	65	-4	79	27	86	33	91	49
West Leavenworth, Kans.....	55	-26	60	1	74	12	78	30	86	40	(1)	(1)
Westmoreland, Kans.....	(1)	(1)	(1)	(1)	(1)	(1)	80	21	85	34	95	46
West Union, Iowa.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
White Plains, N. Y.....	41	-1	48	-2	60	3	70	28	82	28	85	51
Wilkesbarre, Pa.....	50	-9	59	-1	60.9	-2.5	76.1	26	91	82	91	40
Williamstown, Mass.....	39	-6.8	49	4	49.9	-2.1	67.5	27.7	80.7	81	85.6	40.5
Wilton Centre, Ill.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Woodstock, Md.....	48	-2	68	5	65	5	80	28	91	38	91	41
Woodstock, Vt.....	45	-36	52	-5	54	-16	75	17	85	25	96	36.3
Worcester, Mass.....	42	-1	56	1	52	2	(1)	(1)	80	33	86	47
Wyandotte, Kans.....	(1)	(1)	(1)	(1)	70	9	73	28.5	81	40	90	55
Wytheville, Va.....	58	-2	72	2	69	11	81	26	83	37	85	43
Wytheville, Va.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Yates Centre, Kans.....	60	-22.5	62	-4	76	6	77	28.4	83	32.5	93.5	47.4
Yutan, Nebr.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)

<sup>1</sup> No record.

<sup>\*</sup> Three and one-half miles from.

*Fahrenheit*) from reports made by voluntary observers of the Signal Service, &c.—Continued.

July.		August.		September.		October.		November.		December.		Annual range.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
100	50	98	47	96	34	88	20	76	8	69	-14	119
98	50	91	49	78	32	80	8	58	-19	41	-38	.....
93	62	90.7	56	90	57	88	30	64	17	66	-8.5	.....
87	50	88.8	47	90	45	81	24	63	-1.6	51	-21	121
89	50	85	47	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....
99	64	98	62	96	49	92	32	74	28	70	8	98
87	58	87	51	89	45	83	26	65	-1	47	-19	117
(1)	(1)	(1)	(1)	92	50	86	28	63	Zero.	48	-24	.....
96	50	86	56	87	40	74	28	56	14	57	-19	106
92	53	93	48	93	44	84	33	60	12	58	-14	113
96	51	95	53	90	41	80	37	74	31	65	23	73
97	65	95	48	96	50	85	37	70	26	65	5	.....
87	72	94	65	86	62	79.2	41.2	54.8	14.5	44.8	-17	111
75	53	78	53	75	45	84	37	(1)	(1)	66	28	.....
91	60	94	51	96	50	84	29	65	Zero.	54	-20	.....
(1)	(1)	90	39	90	36	83	31	82	33	76	20	.....
100.4	68.8	90.4	55.7	91.4	48	88	35	86	12	70	-10	.....
87	47	86	65	86	49	84	26	61	20	70	-2	.....
94	46	91	41	94	39	86	24	64	18	58	-14	112
92	61	94	53	94	46	82	28	62	20	60	-7	101.5
94	54	92	54	93	32	80	28	62	17	51	-13	108
90	58	92	50	94	50	82	32	67	20	60	Zero.	94
97	47	92	46	93	46	89	24	65	9	59	-17	.....
87	70	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....
96	70	99	56	99	50	96	30	78	17	63	-5	.....
93	64	91	60	89	55	94	36	72	30	68	-17	110
86	50	90	44	(1)	(1)	80	23	64	12	58	-5	.....
93	61	91	61	92	55	91	34	68	26	72	10	.....
97.8	65	96	56	(1)	(1)	(1)	(1)	(1)	(1)	62	-10	.....
96	74	92	68	90	64	88	46	84	20	67	6	94
84	54	90	56	86	32	74	26	54	14	50	-24	114
98	50	98.5	55	98	42	93	26	74	18	68	4	.....
98	54	94	50	92	45	86	24	62	9	60	-6	122
99	51	89	46	89	45	82.5	24	55	-6	44	-26	117
94	67	93	55	94	53	(1)	(1)	(1)	(1)	60	-8	.....
86	45	90	37	91	36	83	23	58	10	54	-27	118
86	56	86.6	51	88	45	82	22	62	0.7	51	-19	117
93	56	92	58	99	42	(1)	(1)	(1)	(1)	(1)	(1)	.....
91	72	91	71	(1)	(1)	93.5	44	78	34	76	22	.....
94	60	96	58	98	53	85	32	60	20	56	-4	.....
86	50	93	50	97	37	86	26	65	18	63	-10	107
98	62	94	53	94	52	88	32	70	6	62	-14	.....
82	59	85	54	83	49	81	30	64	16	56	-9	110
90	48	93	46	92	43	84	27	60	12	58	-14	112
95	62	95	51	98	48	89	32	79	10	62	-6	120.5
91	43	93	41	91	41	81	26	58	8	47	-11	115
91	51	92	33	91	27	82	17	59	13	56	-15	114.5
95	50	92	54	94.9	38.7	91	25	72	19	67	-4	103.5
(1)	(1)	(1)	(1)	(1)	(1)	89	20	66	-5	60	-30	.....
90	54	93	51	92	47	90	27	70	16	66	-6	.....
95	59	91	56	92	43	89	26	67	16	64	-4	.....
89	58	94	50	82	40	84	28	64	18	62	-12	.....
91	58	90	53	87	52	83	31	64	10	56	-15	111
84	40	86	38	84	34	80	20	57	14	41	-30	121
92	43.9	94.3	38.9	95.3	30.5	88	18	63	4.7	56.3	-32.4	127.7
97	48	95	43	93	25	88	Zero.	75	-25	61	-36	141
97	61	92	62	95	52	95	83	76	24	70	8	97
105	57	97	51	100	47	92	31	74	14	60	-7	118
92	42	96	30	92	36	82	28	62	26	60	-12	.....
95	55	(1)	(1)	96	36	82	26	66	16	61	-12	.....
90.5	54	91	49	98	43	88	28	68	17	62	-1	94
89	47	92	43.5	91	36	86	23	64	12	59	-22	.....
100	59	94	52	91	49	86	33	71	12	59	-3	.....
98	51	95	48	94	46	(1)	(1)	(1)	(1)	(1)	(1)	.....
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....
88	60	85	56	85	48	85	25	65	-10	44	-25	.....
90	49	94	38	(1)	(1)	82	23	64.1	16.5	49	-7	94
84.2	54.2	86	46	83.4	38.4	73	25	51	21	58	-20	106
88	58	92	52	92	43	87	25	69	4	65	-24	.....
93	49	92	47	91	37	87	28	67	17	61	-8	101
93	42	96	38	(1)	(1)	74	25	66.6	10	52	-32	.....
82	51	87	45	86	42	76	27	62	18	56	-12	.....
97	63	93	48	91	46.5	86	29	67	13	60	-3	.....
87	45	86	48	86	38	86	25	67	20	67	Zero.	89
(1)	(1)	91	55	86	42	(1)	(1)	(1)	(1)	(1)	(1)	.....
100	54	100	47	100	51	89.4	31.4	65	12	64	-7	122.5
100	63	92	54	91	49	85	28	65	1	54	-21	.....

(1) No record.

## APPENDIX 18.

*Monthly and annual mean temperatures (in degrees Fahrenheit) at military post hospitals, for the year ending December 31, 1884.*

[The daily mean is obtained by dividing the sum of the 7 a. m., 2 and twice the 9 p. m. (local time) observations by 4. The monthly by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Abraham Lincoln, Fort, Dak.	0	0	0	0	0	0	0	0	0	0	0	0	0
Alcatraz Island, Cal.	2.2	-2.6	18.5	38.6	57.2	71.1	65.9	68.3	57.2	45.9	27.6	1.7	37.6
Angel Island, Cal.	48.3	47.9	52.3	53.2	54.9	56.6	57.3	55.5	56.9	55.2	55.4	51.5	53.8
Asanaboline, Fort, Mont.	52.4	51.6	52.3	56.3	60.3	61.4	63.6	60.9	60.5	58.0	57.2	52.2	57.2
Barrancas, Fort, Fla.	13.2	4.2	23.1	42.5	59.0	67.9	(1)	67.3	51.7	47.1	36.6	2.8	48.1
Bentica Barracks, Cal.	43.8	55.7	64.8	69.0	77.8	81.1	85.2	84.4	(1)	(1)	(1)	(1)	81.1
Bidwell, Fort, Cal.	47.6	48.1	53.4	55.9	61.7	62.1	63.2	63.3	64.3	60.4	56.5	50.2	58.1
Brady, Fort, Mich.	33.8	29.7	37.4	44.2	55.8	58.5	63.9	69.1	54.0	52.4	46.0	30.3	47.9
Bridger, Fort, Wyo.	8.0	8.7	15.5	36.8	49.3	64.0	59.3	62.0	57.7	46.6	30.6	18.0	38.3
Brown, Fort, Tex.	30.6	18.8	28.1	35.7	48.9	60.5	66.2	62.6	48.9	42.7	34.7	25.6	40.9
Buford, Fort, Dak.	(1)	(1)	(1)	(1)	(1)	(1)	85.6	84.1	82.0	74.9	65.4	60.7	77.1
Columbus, Fort, N. Y. H.	5.6	-2.0	19.6	39.3	(1)	71.1	68.4	70.2	52.7	45.5	28.6	0.3	48.1
Concho, Fort, Tex.	25.8	34.5	37.4	(1)	58.8	69.0	70.8	71.9	70.2	56.4	41.3	33.8	64.8
David's Island, N. Y.	39.0	48.5	54.8	62.6	68.7	78.3	87.1	82.1	80.8	67.1	55.0	42.7	64.8
Ellis, Fort, Mont.	24.9	32.7	55.8	46.6	57.5	68.7	71.4	73.0	71.2	60.0	44.5	35.4	51.8
Fred Steele, Fort, Wyo.	17.8	13.0	27.5	39.0	53.2	63.4	68.8	65.4	47.8	44.5	35.2	3.5	39.5
Gaston, Fort, Cal.	(1)	(1)	39.9	35.5	50.0	65.2	68.6	65.5	55.4	45.3	31.8	19.1	51.8
Hamilton, Fort, N. Y. H.	41.9	41.7	47.8	53.3	62.4	63.8	68.1	72.6	59.9	54.0	49.7	41.7	54.7
Keogh, Fort, Mont.	26.2	34.4	36.1	45.8	57.4	69.0	70.1	73.1	70.4	57.6	43.8	34.4	51.5
Klamath, Fort, Oreg.	12.4	7.6	25.8	40.0	(1)	(1)	67.9	70.6	54.7	48.1	33.3	5.3	48.1
Lewis, Fort, Colo.	24.2	22.5	33.4	41.0	52.5	54.9	58.9	60.2	54.2	41.6	(1)	27.9	51.8
Lyon, Fort, Colo.	22.3	24.2	28.7	35.0	48.4	58.6	62.5	60.2	52.9	46.3	35.1	25.6	41.6
Madison Barracks, N. Y.	24.2	26.6	40.8	49.0	59.9	71.3	79.1	73.8	69.5	57.2	40.1	20.4	51.0
Mason, Fort, Cal.	13.9	23.6	27.6	40.2	52.8	65.4	65.1	67.8	64.3	49.9	38.1	24.9	44.3
McDermitt, Fort, Nev.	49.8	50.9	56.4	57.8	60.6	60.0	68.4	59.3	57.4	58.2	56.2	51.8	57.2
McDowell, Fort, Ariz.	23.8	22.0	32.5	39.5	46.1	57.3	68.3	70.6	51.4	46.8	41.2	29.1	44.0
McHenry, Fort, Md.	49.2	(1)	(1)	63.8	(1)	84.1	95.9	87.6	77.6	(1)	59.2	48.8	84.8
Meade, Fort, Dak.	37.1	38.3	(1)	50.8	63.5	71.7	74.3	73.9	71.4	58.7	44.0	33.9	64.8
Meade, Fort, Dak.	20.1	8.0	26.6	38.2	51.8	65.9	64.7	63.6	55.3	48.7	37.0	6.5	40.5
Mojave, Fort, Ariz.	51.7	52.5	(1)	67.3	77.0	86.5	98.4	92.2	81.8	73.3	65.6	51.9	84.8
Monroe, Fort, Va.	35.2	47.0	47.0	52.1	66.3	72.2	75.9	75.5	74.0	64.9	51.5	42.9	58.7
Mount Vernon Barracks, Ala.	43.7	59.4	63.9	67.1	74.5	76.6	81.3	80.6	80.3	74.1	57.2	54.8	67.8
Niagara, Fort, N. Y.	19.3	26.4	30.1	40.0	51.6	64.7	66.4	68.5	66.1	52.6	37.4	29.5	46.0
Pembina, Fort, Dak.	-8.6	-10.1	8.8	(1)	49.3	(1)	(1)	(1)	(1)	(1)	23.6	-0.8	48.1
Plattsburg Barracks, N. Y.	9.7	22.0	26.9	41.8	53.9	67.1	66.8	69.2	63.2	47.6	34.5	22.6	43.8
Presidio, Cal.	48.2	48.5	52.9	54.2	57.8	58.7	58.8	57.7	57.3	55.2	55.4	51.6	55.2
Randall, Fort, Dak.	14.0	8.5	29.8	45.7	61.0	73.1	72.0	70.8	65.3	54.4	35.5	11.6	45.2
Reno, Fort, Ind. T.	30.5	35.5	(1)	55.8	65.3	74.6	81.9	76.4	78.1	60.8	47.5	27.9	67.8
Robinson, Fort, Nebr.	23.0	18.0	(1)	41.6	57.2	71.6	73.6	69.9	62.8	53.6	37.5	(1)	58.7
Saint Augustine, Fla.	51.6	60.6	65.6	75.4	74.6	76.0	81.1	79.3	79.3	73.4	63.8	60.9	70.1
Shaw, Fort, Mont.	21.9	9.9	27.4	40.3	52.4	63.0	61.5	64.0	50.1	47.8	39.5	(1)	58.7
Sheseton, Fort, Dak.	-0.4	-2.5	17.1	38.3	55.8	69.5	64.6	65.1	57.4	44.3	27.2	3.2	36.8
Snelling, Fort, Minn.	3.7	8.0	24.1	44.0	58.6	68.5	68.2	68.0	62.9	49.5	28.1	8.9	41.0
Spokane, Fort, Wash.	22.4	16.1	34.8	49.6	60.1	68.2	66.3	72.7	52.5	46.6	(1)	31.5	58.7
Sully, Fort, Dak.	11.6	5.5	27.2	44.0	56.7	73.7	70.9	71.2	64.2	52.9	34.3	8.7	43.6
Totten, Fort, Dak.	-2.2	-4.6	13.3	36.3	56.1	69.6	64.2	65.8	55.4	42.6	23.9	0.3	35.1
Townsend, Fort, Wash.	40.0	34.9	43.0	52.0	56.1	61.1	61.4	63.2	53.9	49.8	47.3	33.0	49.6
Union, Fort, N. Mex.	31.5	34.7	39.3	42.6	52.6	61.9	72.4	63.9	60.6	(1)	48.5	33.5	58.7
West Point, N. Y.	(1)	(1)	(1)	46.3	58.7	70.2	70.5	(1)	67.9	(1)	41.0	31.9	58.7
Wingate, Fort, N. Mex.	31.7	33.4	39.1	45.4	57.7	67.4	75.0	67.5	62.3	53.4	42.0	36.0	50.9
Yates, Fort, Dak.	5.9	1.4	21.1	40.8	58.7	72.4	67.5	69.2	59.0	47.7	29.2	5.2	39.8

(1) No record.





## APPENDIX 19.

*Monthly maximum and minimum temperatures (in degrees Fahrenheit) and annual range*

[From self-regis]

Stations.	January.		February.		March.		April.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Abraham Lincoln, Fort, Dak.....	40	-45	40	-35	60	-18	72	15	84	29	92	43
Alcatraz Island, Cal.....	58	89	70	29	66	41	65	44	73	47	75	49
Angel Island, Cal.....	71	88	77	28	82	43	77	33	93	49	88	52
Asinaboine, Fort, Mont.....	45	-31	44	-40	55	-32	75	12	88	27	101	44
Barrancas, Fort, Fla.....	74	10	85	27	85	34	86	43	98	61	96	61
Benicia Barracks, Cal.....	61	34	73	23	72	40	73	44	26	51	82	55
Bidwell, Fort, Cal.....	56	5	67	19	63	15	77	25	78	26	81	37
Brady, Fort, Mich.....	36	-32	33	-39	37	-28	69	17	74	29	91	36
Bridger, Fort, Wyo.....	44	-15	44	-39	47	Zero.	57	14	73	20	84	30
Brown, Fort, Tex.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Bunford, Fort, Dak.....	44	-43	45	-43	58.8	-22.7	76	10	85.5	25.2	100	34
Columbus, Fort, N. Y. H.....	45	6	56	6	63	7	(1)	(1)	85	42	92	49
Concho, Fort, Tex.....	78	5	83	17	89	26	95	32	95	44	100	53
Dad's Island, N. Y.....	47	4	54	3	61	4	67	30	86	39	93	44
Ellis, Fort, Mont.....	48	-17	50	-26	54	-14	70	30	82	20	93	30
Fred Steele, Fort, Wyo.....	(1)	(1)	(1)	(1)	55	2	68	12	80	16	93	36
Gaston, Fort, Cal.....	62	26	74	30	73	33	80	38	95	36	90	42
Hamilton, Fort, N. Y. H.....	50	-3	54	-5	62	5	70	31	85	43	91	45
Keogh, Fort, Mont.....	45	-32	55	-33	68	-25	78	12	(1)	(1)	(1)	(1)
Klamath, Fort, Oreg.....	45	-5	56	-30	56	6	70	20	82	21	85	31
Lewis, Fort, Colo.....	50	-14	48	-31	51	-1	60	13	71	22	84	35
Lyon, Fort, Colo.....	46	-7	59	-33	50	9	80	23	91	17	98	47
Madison Barracks, N. Y.....	41	-29	51	-3	52	-3	73	13	81	31	90	40
Mason, Fort, Cal.....	59	41	68	29	73	45	73	50	78	50	75	50
McDermitt, Fort, Nev.....	49	-3	49	-18	53	23	56	31	62	35	84	40
McDowell, Fort, Ariz.....	71	28	85.8	23.7	78.8	36.5	92	37	102.2	43.5	113	50
McHenry, Fort, Md.....	50	6	64	8	62	13	77	53	87	45	81	51
Meade, Fort, Dak.....	54	-21	57	-28	66	-11	73	12	82	25	97	38
Mojave, Fort, Ariz.....	71	32	78	37	(1)	(1)	82	44	100	58	110	59
Monroe, Fort, Va.....	63	3	67	37	72	20	77	38	68	50	89	55
Mount Vernon Barracks, Ala.....	74	10	80	34	84	33	87	40	92	55	96	54
Niagara, Fort, N. Y.....	47	-9	57	-3	55	-2	72	26	79	32	86	44
Pembina, Fort, Dak.....	34	-35	34	-37	39	-26	66	9	83	29	(1)	(1)
Plattsburg Barracks, N. Y.....	45	-27	49	-3	51	-5	66	15	79	36	88	40
Presidio, Cal.....	62	37	73	28	73	38	70	41	85	43	70	47
Randall, Fort, Dak.....	48	-29	53	-29	70	-12	74	22	89	33	96	40
Reno, Fort, Ind. T.....	69	-4	72	3	(1)	(1)	85	31	89	37	93	55
Robinson, Fort, Nebr.....	51	-22	56	-39	(1)	(1)	76	10	88	26	97	46
Saint Augustine, Fla.....	77	22	83	42	85	40	86	45	90	62	91	63
Shaw, Fort, Mont.....	51	-15	53	-32	55	-22	71	21	81	27	91	45
Siascon, Fort, Dak.....	45	-44	42	-29	46	-23	65	16	79	27	89	44
Snelling, Fort, Minn.....	43	-33	37	-25	61	-20	74	18	83	31	99	35
Spokane, Fort, Wash.....	51	-5	49	-32	65	8	77	29	91	30	95	37
Sully, Fort, Dak.....	52	-30	57	-30	72	-6	75	20	88	33	99	47
Totten, Fort, Dak.....	35	-39	38	-31	42	-21	65	10	83	29	96	45
Townsend, Fort, Wash.....	57	25	67	8	60	26	72	36	80	36	88	40
Union, Fort, N. Mex.....	65	-13	67	-21	63	9	73	15	79	12	88	33
West Point, N. Y.....	(1)	(1)	(1)	(1)	(1)	(1)	74	29	87	33	97	43
Wingate, Fort, N. Mex.....	51	7	56	8	59	11	69	18	77	26	87	34
Yates, Fort, Dak.....	42	-44	49	-38	56	-14	79	19	83	34	97	48

<sup>1</sup> No record.

## APPENDIX 19.

*of temperature at military post hospitals for the year ending December, 31, 1884.*

*tering thermometers.]*

July.		August.		September.		October.		November.		December.		Annual range.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
°	°	°	°	°	°	°	°	°	°	°	°	°
86	43	96	43	82	30	80	10	65	-15	48	-43	141
74	48	65	48	69	46	68	47	70	48	65	38	46
86	51	85	52	80	51	83	47	76	46	72	32	65
(1)	(1)	95	37	80	21	85	10	70	-15	65	-50	-----
96	70	96	67	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	-----
97	56	95	54	90	52	78	47	60	43	64	32	69
83	40	83	43	78	30	78	25	70	20	58	2	107
83	37	88	35	88	38	76	18	62	5	48	-24	128
86	30	84	31	78	19	75	15	55	14	60	-9	125
96	77	97	71	96	69	87	60	81	47	83	29	-----
96	28	102	39	82	34	86	11	62	-12	58	-43	145
89	58	92	56	98	50	84	31	68	19	60	8	-----
110	68	108	60	101	62	95	42	80	38	83	10	105
62	46	94	61	95	35	85	18	65	21	62	-7	102
98	36	98	37	85	25	81	18	67	-1	60	-13	119
98	32	91	38	87	28	76	9	62	2	55	-24	-----
102	41	102	46	87	40	76	34	78	35	68	16	86
95	47	97	52	95	45	89	30	62	21	60	-1	102
94	45	108	39	86	28	87	11	69	-24	55	-48	-----
87	30	(1)	(1)	76	16	78	11	(1)	(1)	54	-15	-----
88	39	87	38	75	22	70	20	60	12	58	-18	109
104	52	104	43	95	37	99	27	74	7	70	-21	127
90	44	88	43	87	30	79	19	59	4	57	-39	119
81	54	74	50	69	50	76	49	71	46	62	40	52
90	43	95	47	86	32	77	25	66	21	55	-2	113
116	66	113	50	102	51	(1)	(1)	89	34	80	24	-----
98	61	90	57	92	49	85	32	71	22	62	4	89
95	40	96	34	83	20	86	12	71	-12	72	-32	129
112	67	114	68	103	55	95	47	85	37	79	30	-----
98	63	90	64	89	58	89	38	73	30	69	9	90
96	64	101	53	97	57	96	36	78	27	80	15	91
88	50	92	45	90	44	81	25	62	15	54	Zero.	101
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	58	-19	44	-47	-----
90	46	96	42	92	34	79	26	58	8	53	-19	123
88	46	75	48	78	43	77	43	71	44	(1)	(1)	-----
95	47	96	44	97	36	89	18	78	-4	58	-31	128
101	62	101	58	98	52	90	35	76	19	68	-1	-----
101	40	97	42	94	52	87	14	73	-8	(1)	(1)	-----
98	63	91	70	89	66	86	53	77	-40	80	35	71
85	28	82	37	82	21	80	21	68	-4	(1)	(1)	-----
85	44	86	41	86	32	78	12	62	-22	42	-36	138
95	46	101	45	95	38	85	19	61	-15	45	-37	138
96	42	108	44	81	31	71	24	(1)	(1)	(1)	(1)	-----
100	51	99	48	96	35	89	19	72	-7	59	-37	137
86	43	94	44	88	34	85	12	61	-21	45	-40	136
78	45	96	45	67	37	64	33	68	25	55	11	80
95	47	92	43	82	33	(1)	(1)	67	14	67	-10	-----
94	54	(1)	(1)	95	45	(1)	(1)	64	15	64	-12	-----
83	48	87	43	81	30	76	24	59	13	56	-4	101
96	42	96	45	90	29	89	11	68	-31	53	-57	141

<sup>1</sup> No record.

10048 SIG—9

## APPENDIX 20.

*Monthly and annual mean temperatures (in degrees Fahrenheit) at stations on the Central Pacific and Southern Pacific Railroads, and connecting branches, for the year ending December 31, 1884.*

[The daily mean is obtained by dividing the sum of the maximum and minimum temperatures by two; the monthly, by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual mean.
Alta, Cal.	43.2	39.4	43.2	47.0	58.0	61.3	69.8	72.6	58.8	55.7	57.4	41.0	54.0
Anaheim, Cal.	57.0	60.4	63.8	65.0	69.2	71.5	74.2	75.4	69.0	68.5	58.9	56.1	63.7
Antioch, Cal.	43.5	44.8	48.7	55.2	64.6	67.6	73.3	73.6	66.4	59.3	52.6	45.8	58.0
Aptos, Cal.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	62.4	60.3	60.2	53.4	51.8	49.9	.....
Auburn, Cal.	45.3	43.8	48.7	51.9	62.1	63.5	72.0	76.6	64.2	58.7	58.6	45.3	57.1
Battle Mountain, Nev.	26.9	21.0	40.1	45.7	61.9	66.2	74.3	76.6	58.9	46.9	38.2	34.2	49.2
Benson, Ariz.	45.4	54.1	57.0	64.1	75.4	( <sup>1</sup> )	92.0	84.5	76.5	70.2	56.3	48.1	.....
Beowawe, Nev.	25.6	24.1	37.6	46.3	57.6	64.6	72.5	75.4	57.1	50.5	39.7	31.8	48.6
Bishop's Creek, Nev.	( <sup>1</sup> )	( <sup>1</sup> )	45.4	57.4	65.8	69.9	85.5	80.9	64.5	60.9	48.7	49.4	.....
Blue Creek, Utah	22.5	23.0	33.8	45.8	60.4	69.3	71.3	75.8	60.2	50.2	42.0	30.2	49.5
Boca, Cal.	22.6	18.7	30.0	37.4	49.0	56.2	60.7	64.6	51.1	46.0	35.8	31.6	42.0
Borden, Cal.	49.2	53.0	59.8	60.1	68.8	69.5	77.6	86.6	69.6	58.2	58.4	50.6	63.4
Brentwood, Cal.	45.5	45.4	53.6	54.4	64.0	66.7	76.3	76.9	67.5	65.5	54.6	48.0	60.0
Brighton, Cal.	47.2	48.4	54.0	57.8	66.9	68.3	72.9	76.4	66.7	60.8	55.7	48.5	60.3
Brown's, Nev.	30.8	30.4	44.0	52.6	68.0	74.1	82.6	83.9	65.6	54.5	42.6	36.9	55.5
Byron, Cal.	47.2	50.0	59.8	58.3	68.3	70.9	82.1	81.3	69.6	63.0	59.0	51.2	63.4
Cabazon, Cal.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	82.5	78.4	68.6	62.2	49.4	.....
Caliente, Cal.	47.7	49.5	54.8	55.2	70.0	70.9	82.5	81.7	72.0	64.1	52.0	47.6	62.3
Calistoga, Cal.	45.3	45.6	50.8	55.2	64.8	67.2	72.2	72.2	64.2	59.8	53.2	47.7	58.8
Carlin, Nev.	17.9	17.9	34.2	42.5	55.4	62.9	68.1	68.8	51.9	45.6	33.2	26.8	43.7
Casa Grande, Ariz.	53.2	54.6	59.1	69.1	80.5	88.6	96.7	91.5	83.4	76.8	68.6	54.5	73.0
Chico, Cal.	46.6	44.4	53.8	60.7	71.2	70.2	84.1	86.7	69.1	58.4	57.5	50.6	62.8
Chualar, Cal.	48.8	49.5	51.5	54.3	( <sup>2</sup> )	57.7	61.0	59.7	56.9	53.1	51.3	49.2	.....
Cisco, Cal.	32.8	27.5	31.2	24.3	43.4	51.0	63.1	63.1	46.9	45.5	42.6	29.9	42.6
Colfax, Cal.	45.6	44.1	46.9	49.9	62.6	63.0	73.8	77.2	65.7	59.0	55.9	46.2	57.5
Colton, Cal.	49.3	55.3	61.2	59.1	66.0	69.6	75.4	76.8	65.8	59.5	55.9	50.7	62.0
Corinne, Utah	22.9	26.5	39.2	49.5	61.4	72.5	77.8	77.4	59.5	51.6	39.1	32.9	50.9
Daggett, Cal.	44.2	48.1	50.3	55.4	66.9	77.8	88.7	86.8	( <sup>3</sup> )	.....	.....	.....	.....
Davis, Cal.	44.6	49.2	57.2	61.5	74.5	74.2	82.5	86.3	61.9	64.6	60.1	51.4	64.0
Delano, Cal.	44.8	49.0	47.2	53.5	( <sup>2</sup> )	70.2	80.9	83.6	71.8	61.1	60.2	50.5	.....
Delta, Cal.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	55.8	48.7	40.0	.....
Deming, N. Mex.	42.8	48.0	57.7	61.4	69.8	77.5	85.6	81.1	76.8	69.9	54.8	53.1	64.9
Dunnigan, Cal.	43.6	49.2	56.0	64.6	69.8	71.9	80.7	79.2	72.8	61.7	54.5	47.5	63.0
Elko, Nev.	30.6	18.0	35.3	45.6	58.1	65.8	71.0	68.6	51.5	44.0	31.7	29.2	45.0
El Paso, Tex.	39.5	41.4	46.4	51.8	64.3	( <sup>1</sup> )	( <sup>1</sup> )	53.8	( <sup>1</sup> )	64.0	47.4	44.0	.....
Emigrant Gap, Cal.	35.5	31.7	36.2	38.4	50.8	53.9	62.0	62.1	52.9	50.6	48.7	37.2	46.7
Farmington, Cal.	45.4	48.2	52.6	57.9	67.0	70.5	72.8	72.6	69.2	62.2	54.4	46.0	59.9
Fenner, Cal.	40.0	48.9	54.5	64.2	73.3	84.4	89.6	( <sup>1</sup> )	79.0	( <sup>3</sup> )	.....	.....	.....
Fresno, Cal.	46.7	49.5	54.3	59.4	70.9	73.5	82.5	( <sup>1</sup> )	71.1	65.8	60.9	55.7	.....
Galt, Cal.	47.7	48.8	56.6	60.0	66.7	75.4	78.6	71.3	66.8	56.2	53.4	49.0	60.9
Gilroy, Cal.	46.5	48.4	54.1	56.8	63.0	65.2	71.1	69.9	65.6	60.0	53.8	48.6	58.7
Golconda, Nev.	31.6	30.2	44.0	53.2	64.7	( <sup>1</sup> )	76.5	81.7	63.9	58.9	47.3	40.1	.....
Goshen, Cal.	47.8	53.1	56.3	59.4	70.0	71.1	85.5	88.8	77.2	62.2	54.8	48.9	64.6
Halleck, Nev.	15.7	17.9	38.1	43.8	53.1	58.0	66.1	62.5	( <sup>1</sup> )	51.4	24.8	28.1	.....
Hawthorne, Nev.	( <sup>1</sup> )	( <sup>1</sup> )	49.0	57.0	68.4	73.9	82.4	83.1	61.6	55.2	49.2	39.2	.....
Hollister, Cal.	49.6	53.3	53.1	56.0	62.9	67.4	70.6	69.5	66.2	61.6	57.3	52.4	60.0
Hotel del Monte, Cal.	49.5	50.6	54.5	57.0	59.7	61.1	61.0	61.1	57.5	54.4	52.2	52.0	55.9
Hot Springs, Nev.	28.9	26.6	40.5	48.9	65.2	60.7	67.1	72.6	54.0	49.5	41.2	34.0	49.1
Humboldt, Nev.	28.2	25.9	40.4	48.8	60.4	67.8	69.9	( <sup>1</sup> )	51.7	38.1	35.9	35.3	.....
Indio, Cal.	52.3	56.4	61.7	67.9	76.0	82.5	93.3	91.7	82.1	74.6	62.6	61.9	71.9
Ione, Cal.	52.4	53.2	55.9	68.7	69.7	68.7	75.6	82.2	70.1	62.9	53.2	50.0	63.4
Keeler, Cal.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	65.6	77.1	82.9	93.5	91.1	84.8	67.9	57.5	41.8	.....
Keene, Cal.	42.7	41.2	45.1	50.5	60.1	67.2	75.9	74.2	59.3	55.8	52.5	42.0	55.5
Kelton, Utah	20.2	23.8	37.1	45.4	59.9	70.8	75.4	72.3	56.0	( <sup>1</sup> )	35.6	33.4	.....
Kingsburg, Cal.	56.2	53.5	56.4	61.7	71.5	75.8	83.6	84.7	72.2	66.0	60.9	51.0	66.1
Knight's Landing, Cal.	49.4	47.7	54.0	58.0	67.2	70.6	75.0	( <sup>1</sup> )	67.6	63.0	58.9	52.1	.....
Lathrop, Cal.	43.5	47.8	52.4	57.9	63.6	64.8	69.6	( <sup>1</sup> )	73.0	57.6	49.9	46.3	.....
Lemoore, Cal.	52.1	46.6	51.9	56.1	71.6	72.7	81.1	85.9	( <sup>1</sup> )	63.7	53.2	45.7	.....

<sup>1</sup> No record.

<sup>2</sup> Record incomplete.

<sup>3</sup> Observations discontinued.

Monthly and annual mean temperatures (in degrees Fahrenheit) at stations on the Central Pacific and Southern Pacific Railroads, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual mean.
Livermore, Cal.	49.7	49.2	54.1	54.4	59.8	62.2	67.6	67.5	63.8	60.2	55.5	50.0	57.8
Lordsburg, N. Mex.	38.5	46.1	51.5	52.7	77.1	85.7	91.8	80.4	74.8	62.9	49.9	42.6	63.2
Los Angeles, Cal.	59.2	60.1	62.0	63.8	68.3	70.0	74.9	78.3	71.0	67.3	64.8	56.8	66.0
Mammoth Tank, Cal.	54.7	59.0	58.9	68.8	85.0	92.9	90.8	100.1	89.9	80.3	66.9	54.5	75.1
Mariacopa, Ariz.	48.0	55.8	50.5	68.1	81.9	89.6	93.7	89.9	79.5	71.9	59.3	55.9	71.1
Martinez, Cal.	48.8	44.4	54.1	54.8	61.2	63.6	66.6	65.7	59.5	55.5	51.4	47.0	50.2
Marysville, Cal.	43.7	48.0	55.8	67.0	69.1	70.8	76.9	82.4	80.2	67.2	55.9	49.2	63.8
Menlo Park, Cal.	46.4	48.1	53.2	57.3	65.6	65.3	69.8	66.0	59.6	( <sup>1</sup> )	53.3	48.3	.....
Merced, Cal.	47.4	48.9	51.5	59.7	68.4	70.6	77.6	79.0	62.0	63.0	59.9	50.8	61.4
Modesto, Cal.	40.4	46.4	52.2	56.2	65.5	67.6	80.7	( <sup>1</sup> )	69.4	64.6	62.2	46.0	.....
Mojave, Cal.	45.8	45.2	52.2	51.8	55.3	60.2	77.0	78.3	( <sup>1</sup> )	73.4	( <sup>1</sup> )	( <sup>1</sup> )	.....
Monterey, Cal.	50.1	50.6	55.9	67.9	60.8	62.5	62.6	62.4	59.3	57.5	53.4	51.5	57.0
Napa, Cal.	48.8	52.0	52.8	51.3	68.2	69.2	66.7	67.0	( <sup>1</sup> )	55.2	53.5	48.6	.....
Needles, Ariz.	51.7	53.8	60.7	63.8	77.8	80.3	93.7	89.2	78.2	( <sup>2</sup> )	.....	.....	.....
Newhall, Cal.	48.4	48.9	51.4	46.0	62.9	68.1	73.9	76.8	65.7	60.5	56.5	47.3	58.8
Niles, Cal.	46.6	49.2	53.1	54.3	60.9	62.5	68.4	67.8	65.0	57.4	51.0	48.1	57.0
Oakland, Cal.	49.0	49.2	53.4	55.5	58.0	60.3	61.5	58.9	53.8	56.5	54.8	51.2	55.6
Ogden, Utah	24.4	28.4	41.4	50.7	64.3	75.9	78.9	77.2	61.3	51.6	39.5	34.9	52.4
Oriand, Cal.	49.2	50.1	55.4	59.4	72.4	73.3	84.7	85.4	72.8	67.4	59.1	52.7	65.2
Otero, Nev.	19.6	19.8	33.3	44.9	54.9	64.9	73.5	72.9	58.8	45.2	37.9	25.4	46.8
Pajaro, Cal.	48.8	52.9	52.8	54.6	60.3	62.7	62.0	64.0	59.4	56.1	54.0	49.2	55.5
Paliades, Nev.	24.6	20.0	38.2	47.2	63.3	72.9	77.9	78.9	55.4	41.4	29.1	28.0	47.6
Pantano, Ariz.	49.4	51.1	55.0	56.3	66.1	( <sup>1</sup> )	80.3	80.8	75.7	68.5	60.4	52.0	.....
Petaluma, Cal.	45.8	47.7	53.0	55.6	62.1	63.0	65.5	66.0	62.8	( <sup>1</sup> )	55.4	51.8	.....
Pleasanton, Cal.	46.4	46.0	51.1	57.6	63.7	63.7	73.8	75.2	68.2	65.5	60.5	49.9	60.0
Promontory, Utah	21.5	22.9	37.6	44.9	58.4	72.5	79.8	71.6	61.8	52.3	( <sup>1</sup> )	26.1	.....
Ravenna, Cal.	46.6	49.5	48.5	54.4	63.0	65.8	73.2	80.5	67.8	57.7	53.0	47.0	58.7
Red Bluff, Cal.	45.4	45.2	50.7	55.6	69.6	71.3	81.1	85.1	70.0	65.7	58.4	48.6	62.2
Redding, Cal.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	59.9	69.9	67.8	70.8	( <sup>1</sup> )	72.6	65.6	59.1	44.9	.....
Reno, Nev.	27.5	25.7	37.1	41.9	54.5	62.3	69.3	66.7	53.4	47.4	41.8	35.4	47.1
Rocklin, Cal.	48.6	47.3	53.0	57.6	66.9	69.2	75.3	81.3	( <sup>1</sup> )	58.6	( <sup>1</sup> )	45.9	.....
Sacramento, Cal.	46.7	47.9	54.3	59.9	68.6	70.4	73.1	75.2	65.3	59.8	54.7	48.6	60.5
Salinas, Cal.	46.4	49.3	58.9	56.4	63.3	63.9	69.4	63.1	61.4	58.9	52.7	49.0	58.8
San Fernando, Cal.	52.7	52.9	63.6	57.8	63.1	( <sup>1</sup> )	72.4	75.0	67.9	62.4	60.3	50.4	.....
San José, Cal.	47.8	48.6	52.6	55.2	62.3	61.6	65.4	65.6	62.0	( <sup>1</sup> )	54.5	51.4	.....
San Mateo, Cal.	44.8	45.8	50.3	53.0	59.2	60.8	64.3	60.2	59.8	54.1	52.5	48.9	54.5
San Simon, Ariz.	45.6	51.7	58.7	62.7	73.5	81.8	83.4	81.3	73.3	71.3	61.0	46.0	68.7
Santa Cruz, Cal.	52.5	53.4	55.7	57.7	62.6	63.9	65.1	66.1	62.6	60.1	56.3	45.0	59.2
Soledad, Cal.	45.4	49.7	53.2	58.4	65.8	65.9	65.8	66.2	60.3	57.5	51.9	45.9	57.2
Soquel, Cal.	55.6	50.9	53.5	54.4	63.8	69.9	65.9	( <sup>1</sup> )	62.8	56.8	55.3	49.3	.....
South Vallejo, Cal.	54.4	52.2	56.4	63.2	65.6	66.7	70.0	66.9	( <sup>1</sup> )	63.0	61.0	54.2	.....
Spadra, Cal.	53.2	54.5	56.2	62.0	65.4	70.7	72.5	77.5	70.7	62.9	61.1	58.5	63.8
Stockton, Cal.	46.4	45.9	53.1	57.8	63.1	64.1	69.9	78.7	63.0	59.4	54.7	48.6	58.3
Suisun, Cal.	37.4	50.5	56.2	59.6	65.6	68.5	73.0	72.7	68.8	63.2	55.4	50.1	59.0
Summit, Cal.	26.3	28.1	29.5	31.6	39.7	44.2	53.9	57.2	45.7	42.2	38.6	28.1	38.5
Sumner, Cal.	51.2	57.8	58.8	59.6	67.7	76.1	81.7	87.1	73.1	61.0	58.0	49.4	65.0
Tecoma, Nev.	15.1	20.2	38.3	44.8	59.9	65.2	70.7	69.9	48.4	43.7	( <sup>1</sup> )	31.3	.....
Tehama, Cal.	45.8	47.0	54.2	56.1	( <sup>1</sup> )	63.9	73.6	78.8	( <sup>1</sup> )	66.6	62.0	46.7	.....
Tehichipa, Cal.	41.9	39.3	44.0	48.4	55.3	59.6	65.0	71.7	60.1	58.4	51.5	38.8	52.8
Tennant, Cal.	49.3	50.1	52.7	56.4	64.8	64.8	69.4	72.5	64.0	61.9	58.6	48.4	59.4
Terrace, Utah	25.3	25.6	40.7	47.0	67.0	70.1	78.4	74.4	62.0	( <sup>1</sup> )	40.9	30.9	.....
Texas Hill, Ariz.	52.5	57.3	62.3	69.4	80.2	88.9	96.9	98.6	84.7	73.8	61.2	51.6	72.7
Toano, Nev.	21.4	22.4	35.4	42.2	52.0	60.8	68.1	69.5	61.4	48.4	39.8	24.4	44.6
Tracy, Cal.	47.6	50.7	56.2	61.3	70.2	74.2	81.1	82.1	71.4	65.7	55.4	48.2	63.7
Truckee, Cal.	25.6	21.9	30.6	39.7	50.8	56.0	63.2	65.6	( <sup>1</sup> )	44.1	37.3	28.1	.....
Tucson, Ariz.	49.7	63.0	65.2	71.8	75.5	85.8	92.4	86.2	83.4	74.7	64.4	54.2	72.1
Tulare, Cal.	46.8	53.0	54.8	60.8	70.7	74.7	81.4	83.4	70.9	62.6	56.8	47.5	63.4
Turlock, Cal.	47.0	50.3	55.1	60.1	75.4	75.3	83.8	82.1	68.2	58.6	52.8	50.7	64.0
Wadsworth, Nev.	38.6	32.6	44.3	53.7	65.2	68.9	78.4	74.1	62.9	52.3	45.3	37.5	54.0
Wells, Nev.	20.0	19.9	38.4	42.0	53.4	60.1	71.9	68.6	62.6	44.3	32.3	27.2	43.5
Willcox, Ariz.	42.3	49.8	51.3	59.5	67.3	76.3	85.4	79.2	73.0	64.5	52.1	43.2	62.0
Williams, Cal.	46.9	47.2	52.6	58.7	71.2	69.9	77.7	80.6	69.2	64.0	57.7	48.1	61.8
Willow, Cal.	47.4	46.0	50.9	58.2	64.7	76.9	78.2	79.6	68.1	62.4	57.2	45.8	61.5
Winnemucca, Nev.	23.4	20.2	38.0	48.8	63.9	72.3	83.3	83.1	58.0	48.8	43.4	34.4	51.6
Woodland, Cal.	48.6	45.6	54.2	56.1	66.5	69.3	79.3	80.4	72.0	( <sup>1</sup> )	59.0	51.1	.....
Yuma, Ariz.	55.6	58.9	60.9	67.4	77.9	( <sup>1</sup> )	94.5	92.1	( <sup>1</sup> )	73.8	63.7	55.8	.....

<sup>1</sup> No record.

<sup>2</sup> Observations discontinued.

## APPENDIX 21.

*Monthly maximum and minimum temperatures, in degrees Fahrenheit, and annual range of branches, for the year end*

[From self-regia

Stations.	January.		February.		March.		April.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Alta, Cal.	60	30	70	16	60	28	68	30	80	46	86	44
Anaheim, Cal.	72	42	89	40	90	86	80	50	92	54	90	54
Antioch, Cal.	60	26	68	22	72	34	72	38	84	50	85	52
Aptos, Cal.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Auburn, Cal.	65	31	73	20	70	33	78	40	84	50	88	50
Battle Mountain, Nev.	50	8	53	30	65	24	72	30	85	42	90	50
Benson, Ariz.	67	20	78	30	78	38	84	48	91	54	(1)	(1)
Beowawe, Nev.	42	19	50	23	54	22	72	33	80	37	87	50
Bishop's Creek, Nev.	(1)	(1)	(1)	(1)	63	32	85	35	90	45	85	63
Blue Creek, Utah.	48	7	49	15	54	25	60	34	84	33	92	42
Boca, Cal.	50	14	45	39	45	2	55	20	68	30	80	40
Borden, Cal.	80	26	97	28	101	84	94	40	104	45	102	45
Brentwood, Cal.	61	28	67	22	76	35	71	42	84	49	90	53
Brighton, Cal.	71	30	74	25	80	41	80	47	92	55	95	55
Brown's, Nev.	51	10	58	16	62	28	74	34	95	62	96	54
Byron, Cal.	62	30	74	26	76	40	76	42	90	50	94	56
Cabazon, Cal.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Caliente, Cal.	70	31	70	28	74	32	70	42	90	50	94	50
Calistoga, Cal.	79	26	76	17	75	31	75	40	90	51	92	55
Carlin, Nev.	44	22	44	34	54	20	66	30	80	34	90	44
Casa Grande, Ariz.	70	32	73	28	75	45	86	52	102	56	113	68
Chico, Cal.	60	30	78	20	76	34	85	48	85	56	97	54
Chualar, Cal.	70	26	85	31	70	37	80	40	98	40	80	40
Cisco, Cal.	44	16	44	Zero.	44	16	42	25	53	32	76	35
Colfax, Cal.	62	34	75	22	68	33	72	36	86	40	90	46
Colton, Cal.	74	31	93	30	90	44	80	43	92	48	103	48
Corinne, Utah.	49	3	53	15	57	24	76	34	84	39	93	56
Daggett, Cal.	70	20	70	20	70	32	80	38	89	53	99	62
Davis, Cal.	62	27	86	28	88	42	86	46	96	49	98	52
Delano, Cal.	62	28	60	36	56	40	74	46	(1)	(1)	97	(1)
Delta, Cal.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Deming, N. Mex.	60	20	60	25	81	44	75	50	89	50	96	61
Dunnigan, Cal.	69	30	82	30	90	37	88	41	92	57	92	48
Elko, Nev.	48	25	50	35	57	15	70	31	88	39	90	50
El Paso, Tex.	65	8	72	20	78	28	90	30	100	35	(1)	(1)
Emigrant Gap, Cal.	51	26	60	6	60	22	58	29	66	40	78	38
Farmington, Cal.	60	27	68	22	69	40	79	46	90	57	94	55
Fenner, Cal.	67	39	79	22	71	40	87	45	98	50	112	65
Fresno, Cal.	66	30	72	29	76	38	81	46	95	52	102	50
Galt, Cal.	65	30	68	22	72	40	77	45	90	50	93	57
Gilroy, Cal.	68	23	75	23	75	40	78	43	88	50	93	53
Gilconda, Nev.	55	6	71	17	75	31	80	37	91	45	(1)	(1)
Goshen, Cal.	70	20	78	27	78	38	84	40	98	50	103	59
Halleck, Nev.	40	35	52	45	58	8	64	28	79	39	88	39
Hawthorne, Nev.	(1)	(1)	(1)	(1)	68	36	78	40	91	54	92	56
Hollister, Cal.	64	30	78	26	78	37	80	37	89	52	90	53
Hotel del Monte, Cal.	64	31	74	28	70	40	71	45	78	50	69	56
Hot Springs, Nev.	50	2	58	32	64	26	75	30	90	82	95	32
Humboldt, Nev.	52	1	70	22	65	20	57	39	72	45	93	60
Indio, Cal.	78	32	88	32	81	49	66	51	103	60	106	65
Ione, Cal.	58	29	81	25	89	38	90	46	94	50	99	40
Keeler, Cal.	(1)	(1)	(1)	(1)	(1)	(1)	86	50	98	54	105	60
Keene, Cal.	58	22	72	16	65	28	75	30	86	41	88	41
Kelton, Utah.	46	8	54	20	54	24	68	(1)	88	40	92	52
Kingsburg, Cal.	52	33	90	32	90	39	90	43	98	50	95	61
Knight's Landing, Cal.	68	30	75	25	70	40	79	48	86	54	87	56
Lathrop, Cal.	60	27	55	36	70	38	76	46	84	52	87	52
Lemoore, Cal.	78	30	64	26	66	34	84	44	95	52	95	52
Livermore, Cal.	70	28	84	26	76	32	78	42	85	47	88	53
Lordsburg, N. Mex.	65	8	80	20	78	30	84	42	95	55	105	70
Los Angeles, Cal.	86	43	89	45	81	46	78	54	78	53	95	52
Mammoth Tank, Cal.	74	33	85	30	86	48	101	52	113	62	128	73

<sup>1</sup> No record.

<sup>2</sup> Record incomplete.

<sup>3</sup> Observations discontinued.

## APPENDIX 21.

*Temperature, at stations on the Central Pacific and Southern Pacific Railroads, and connecting  
ing December 31, 1884.*

tering thermometers.]

July.		August.		September.		October.		November.		December.		Annual range.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
o	o	o	o	o	o	o	o	o	o	o	o	o
90	50	90	50	86	40	80	34	78	40	70	20	74
92	62	96	60	96	50	100	48	87	40	70	36	64
96	56	94	28	90	50	86	40	78	34	66	20	78
80	48	76	52	74	45	70	40	75	37	70	25	.....
95	54	98	56	98	48	82	40	76	39	71	22	78
95	60	99	58	88	38	78	28	66	16	54	-1	129
108	70	102	70	98	58	89	48	78	36	74	30	.....
94	55	98	00	96	40	78	25	68	15	57	-8	121
100	75	95	70	80	50	79	42	70	34	63	20	.....
98	39	93	59	82	30	74	30	60	28	46	6	113
92	38	92	40	90	30	75	21	70	11	60	-10	131
113	50	114	54	108	50	88	48	76	32	76	28	91
95	60	100	65	93	53	90	54	73	39	67	28	78
99	66	105	57	101	52	99	45	85	32	72	22	82
100	54	100	70	98	48	78	36	64	24	62	6	116
100	64	105	62	92	54	80	48	74	48	68	26	79
(1)	(1)	104	62	90	52	90	50	52	48	76	30	.....
100	60	100	62	98	50	90	40	70	30	60	32	72
99	53	100	55	92	42	87	40	78	31	73	19	83
94	48	92	48	66	32	76	24	68	8	50	-12	128
118	83	108	72	100	65	98	53	88	48	72	34	90
105	67	111	65	95	50	78	48	75	85	74	25	91
92	45	90	40	90	40	90	37	90	37	70	20	78
78	40	79	24	79	30	69	25	56	24	49	8	79
94	52	97	58	91	48	86	40	76	40	75	26	75
103	48	110	50	98	50	92	40	82	38	68	30	80
95	60	95	56	90	42	78	30	62	22	48	8	110
104	70	104	64	(1)	(1)	(1)	(1)	87	31	88	25	85
106	62	110	68	106	54	92	44	78	42	79	42	.....
102	65	101	63	98	52	88	48	78	42	79	42	.....
(1)	(1)	(1)	(1)	(1)	(1)	70	42	64	38	65	22	.....
106	70	95	70	94	60	85	48	74	45	75	20	86
99	60	103	60	96	56	80	48	78	38	62	22	81
98	51	97	47	90	22	75	18	68	8	57	-15	138
(1)	(1)	102	70	(1)	(1)	48	40	70	28	74	28	.....
82	48	86	48	80	37	71	30	66	32	64	18	80
104	64	108	61	100	51	86	44	76	38	69	28	86
112	70	(1)	(1)	102	64	(1)	(1)	80	36	70	32	.....
108	62	(1)	(1)	95	53	89	51	80	36	70	32	.....
100	68	104	62	89	51	81	40	76	32	67	25	82
102	53	96	53	90	50	90	45	76	35	72	18	84
100	58	105	60	98	41	83	32	80	19	80	2	.....
106	70	107	65	99	60	90	46	82	32	70	21	87
99	42	101	37	(1)	(1)	80	34	86	8	78	-18	.....
96	65	98	70	82	48	80	38	75	30	70	10	.....
96	54	98	53	90	50	83	46	78	37	72	26	72
76	53	77	50	77	44	77	40	71	40	68	30	50
95	32	99	52	90	38	60	28	70	14	60	-10	131
90	48	(1)	(1)	68	38	54	26	53	16	58	-10	.....
112	82	112	74	104	58	97	52	91	40	88	28	84
100	50	106	50	100	50	90	43	84	31	77	30	86
107	84	108	76	104	68	94	48	78	42	56	30	.....
94	55	98	46	86	38	82	30	75	30	70	12	86
96	58	100	54	84	40	(1)	(1)	61	20	60	5	.....
105	63	106	60	100	52	80	48	82	46	72	25	81
101	60	(1)	(1)	96	54	82	42	84	36	80	28	.....
95	55	(1)	(1)	85	45	82	44	72	50	67	22	.....
101	70	107	70	(1)	(1)	78	50	74	34	65	20	.....
100	54	100	51	95	49	98	42	82	36	80	26	74
110	70	102	70	92	60	86	40	68	38	65	22	102
91	66	96	62	95	60	95	54	92	46	88	35	61
129	78	128	86	115	70	106	58	96	54	84	40	86

*Monthly maximum and minimum temperatures and annual range of temperature at*

Stations.	January.		February.		March.		April.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	°	°	°	°	°	°	°	°	°	°	°	°
Maricopa, Ariz.....	72	14	67	40	76	46	89	40	100	60	115	72
Martinez, Cal.....	65	28	65	26	68	40	73	44	80	50	80	52
Marysville, Cal.....	60	30	79	25	75	38	89	49	90	51	94	52
Menlo Park, Cal.....	60	28	74	24	72	36	76	45	86	54	80	56
Merced, Cal.....	66	28	70	26	72	38	80	44	88	50	96	48
Modesto, Cal.....	65	30	71	29	73	39	81	49	91	50	95	50
Mojave, Cal.....	86	26	73	20	80	30	85	29	82	30	90	40
Monterey, Cal.....	66	30	74	25	72	37	72	42	79	52	70	56
Napa, Cal.....	71	23	74	18	69	32	81	41	85	47	94	52
Needles, Ariz.....	67	32	78	26	76	44	90	50	100	57	110	68
Newhall, Cal.....	76	22	79	28	70	32	80	40	82	45	102	51
Niles, Cal.....	65	32	75	32	73	40	72	41	92	43	87	51
Oakland, Cal.....	58	38	72	32	68	44	70	44	72	49	76	54
Ogden, Utah.....	52	-6	54	-24	60	26	82	34	90	35	100	50
Orland, Cal.....	70	34	78	26	78	30	84	44	98	56	98	54
Otego, Nev.....	42	-10	44	-22	46	10	64	32	74	32	88	44
Pajaro, Cal.....	70	35	80	32	78	32	76	36	88	50	80	54
Palisade, Nev.....	46	-6	49	-30	56	20	76	30	88	35	94	46
Pantano, Ariz.....	85	34	74	35	80	37	77	45	90	40	( <sup>1</sup> )	( <sup>1</sup> )
Petaluma, Cal.....	62	24	78	22	73	38	78	46	94	50	82	52
Pleasanton, Cal.....	68	23	70	22	73	34	79	41	92	50	85	47
Promontory, Utah.....	48	-7	55	-32	55	22	75	35	88	31	100	45
Ravenna, Cal.....	64	20	74	26	68	32	78	38	92	50	100	50
Red Bluff, Cal.....	78	30	76	26	74	36	76	46	90	48	96	53
Redding, Cal.....	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	75	50	76	50	90	57
Reno, Nev.....	49	2	50	-14	60	22	69	32	76	36	84	44
Rocklin, Cal.....	64	30 <sup>2</sup>	75	22	70	39	74	44	88	53	90	57
Sacramento, Cal.....	58	33	70	26	70	39	75	50	85	56	89	57
San Inas, Cal.....	62	30	65	27	68	40	68	46	80	52	78	56
San Fernando, Cal.....	71	30	86	35	70	40	76	42	88	55	( <sup>1</sup> )	( <sup>1</sup> )
San José, Cal.....	70	30	71	28	72	39	71	44	81	48	80	52
San Mateo, Cal.....	59	31	68	28	65	38	68	43	80	50	74	54
San Simon, Ariz.....	69	20	74	20	78	32	82	48	94	48	102	64
Santa Cruz, Cal.....	68	36	76	32	79	38	79	41	80	51	82	53
Soldado, Cal.....	66	26	76	26	80	34	78	44	90	50	84	54
Soquel, Cal.....	78	38	76	28	74	38	70	40	82	50	88	50
South Vallejo, Cal.....	75	39	70	35	71	47	74	46	83	53	82	55
Spadra, Cal.....	68	30	93	32	80	43	87	46	91	50	96	56
Stockton, Cal.....	60	32	65	26	62	40	71	46	80	52	84	54
Suisun, Cal.....	62	18	78	26	80	39	84	46	94	50	88	56
Summit, Cal.....	36	16	43	-7	45	11	42	20	50	30	60	32
Sumner, Cal.....	73	37	76	40	80	39	70	52	94	50	98	56
Tecoma, Nev.....	45	-15	55	-26	60	20	68	26	82	32	90	45
Tehama, Cal.....	60	32	80	30	72	36	78	42	( <sup>1</sup> )	( <sup>1</sup> )	100	50
Tehichipa, Cal.....	58	20	60	9	60	28	64	30	79	35	81	47
Tennant, Cal.....	66	28	79	25	73	34	79	40	86	48	84	48
Terrace, Utah.....	50	-4	60	-20	61	22	62	34	92	50	93	54
Texas Hill, Ariz.....	74	28	88	30	85	49	98	50	108	56	118	67
Toano, Nev.....	46	-18	50	-22	52	28	62	30	74	35	88	38
Tracy, Cal.....	64	28	76	28	30	40	80	46	90	56	97	56
Truckee, Cal.....	50	-1	44	-26	47	8	58	23	72	32	81	42
Tucson, Ariz.....	79	31	88	41	86	45	90	56	98	51	109	70
Tulare, Cal.....	65	31	72	32	71	41	96	50	98	58	100	60
Turlock, Cal.....	72	25	79	22	82	32	94	42	96	58	94	53
Wadsworth, Nev.....	58	8	60	-10	64	28	72	40	84	50	94	50
Wells, Nev.....	46	-12	42	-22	50	12	62	22	78	32	82	34
Willcox, Ariz.....	72	10	85	22	80	27	81	39	92	44	104	58
Williams, Cal.....	64	33	80	26	78	34	76	48	95	58	92	56
Willow, Cal.....	62	32	67	32	81	35	79	36	90	40	107	43
Winnemucca, Nev.....	50	-5	48	-27	65	22	78	30	97	44	99	50
Woodland, Cal.....	66	30	72	29	69	30	74	46	85	56	94	58
Yuma, Ariz.....	69	44	82	37	81	43	95	45	98	63	( <sup>1</sup> )	( <sup>1</sup> )

<sup>1</sup>No record.<sup>2</sup>Record incomplete.



stations on the Central Pacific and Southern Pacific Railroads, &c.—Continued.

July.		August.		September.		October.		November.		December.		Annual range.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
°	°	°	°	°	°	°	°	°	°	°	°	°
113	71	108	72	99	59	93	46	84	37	82	30	101
90	68	88	53	83	40	70	44	68	40	60	32	64
101	61	108	50	100	57	91	48	80	35	80	26	78
96	56	89	53	83	44	(1)	(1)	70	35	64	24	.....
106	56	104	58	94	48	86	43	84	38	80	24	82
103	61	(1)	(1)	93	50	90	45	90	39	70	25	.....
90	50	100	51	(1)	(1)	97	54	(1)	(1)	(1)	(1)	.....
80	54	77	58	77	50	81	40	72	39	69	29	55
100	50	96	50	(1)	(1)	81	38	75	30	67	18	.....
114	76	106	74	98	63	(2)	(2)	.....	.....	.....	.....	.....
100	54	107	58	99	50	92	46	86	35	84	26	85
97	54	98	52	89	54	88	43	74	40	65	30	67
74	54	71	54	70	48	68	43	66	43	63	33	44
96	55	106	55	95	42	80	30	62	23	52	10	120
106	66	110	68	103	54	90	54	80	40	72	32	84
92	54	90	56	83	28	68	30	62	18	58	-14	114
82	52	81	55	88	39	87	33	80	37	80	25	63
100	50	90	60	90	31	60	23	58	9	56	-30	120
106	74	105	65	104	60	98	50	83	47	76	35	.....
98	55	98	42	90	46	(1)	(1)	74	36	72	24	.....
98	59	99	58	94	53	85	45	73	34	68	20	79
105	60	106	54	96	48	72	30	(1)	(1)	49	-6	.....
100	53	106	52	102	48	84	37	78	30	78	30	86
102	63	112	62	100	54	85	51	86	43	74	26	86
102	48	(1)	(1)	91	60	85	50	79	42	69	28	.....
96	55	96	58	84	34	86	26	64	30	57	10	112
95	60	104	57	(1)	(1)	80	43	(1)	(1)	64	25	.....
96	63	97	60	89	54	77	45	78	39	65	30	71
88	54	74	55	84	53	84	40	68	43	72	26	62
91	62	104	84	98	50	91	45	89	45	83	31	.....
94	53	90	53	84	48	(1)	(1)	72	37	72	30	.....
86	55	76	51	78	50	76	43	68	39	64	23	58
108	76	101	65	95	80	90	53	86	43	72	30	88
89	53	91	82	88	48	85	44	80	44	74	34	50
96	54	94	80	80	40	91	42	78	36	76	23	74
86	53	(1)	(1)	82	44	76	42	74	30	70	26	.....
85	58	96	57	(2)	(2)	84	50	76	43	69	33	.....
102	56	108	58	98	55	96	44	82	49	88	32	78
96	56	96	56	88	48	80	46	76	38	65	30	72
101	58	98	57	92	54	90	40	78	38	70	20	63
72	38	72	45	70	32	57	26	58	24	54	3	79
105	59	108	70	96	54	80	40	78	40	76	30	78
96	40	97	48	88	35	74	27	(1)	(1)	56	-5	.....
105	52	110	60	(1)	(1)	88	50	80	38	62	22	.....
86	50	92	54	88	38	78	38	75	26	68	13	83
102	54	96	55	88	46	91	40	82	34	78	18	84
96	64	93	59	79	39	(1)	(1)	60	26	47	9	.....
118	76	120	71	113	62	104	48	90	37	80	30	92
92	40	90	48	75	36	71	31	60	20	42	-18	114
102	60	106	60	96	54	90	46	78	34	70	25	81
86	43	87	48	(1)	(1)	68	28	64	18	56	-7	.....
106	80	107	78	103	70	86	66	79	50	75	39	78
106	64	108	64	100	54	90	46	84	38	72	34	77
106	61	111	55	100	48	81	43	79	35	80	20	91
96	63	100	60	92	44	76	30	68	20	62	Zero.	110
90	46	88	40	83	30	74	38	60	14	50	-14	112
106	73	97	66	94	53	87	40	90	29	70	23	96
106	65	109	64	94	48	85	44	92	34	65	25	84
106	83	100	65	89	58	79	48	76	39	70	25	82
105	70	104	70	84	40	76	32	67	13	57	Zero.	122
80	60	104	60	89	58	(1)	(1)	87	37	71	26	.....
106	84	106	76	(1)	(1)	97	58	87	49	80	43	.....

\*Observations discontinued.

## APPENDIX 22.

*Mean of the maximum and minimum temperatures (in degrees Fahrenheit) at the cotton-region stations of the Signal Service, United States Army, for the months July to October, 1884, and May and June, 1885.*

[These means are obtained by dividing the sums of the daily readings of self-registering thermometers by the number of observations taken—one daily at 5 p. m., central time.]

Stations.	1884.								1885.					
	July.		August.		September.		October.		May.		June.			
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Wilmington, N. C.:	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Charlotte, N. C. ....	80.5	68.5	84.5	66.5	81.9	64.4	76.4	57.8	76.8	58.5	84.8	67.4		
Cheraw, S. C. ....	83.2	67.8	90.0	65.2	80.9	60.0	85.1	58.7	83.3	54.3	80.3	68.4		
Florence, S. C. ....	91.2	60.7	90.5	68.0	86.9	63.1	82.1	56.8	82.6	59.9	89.7	68.1		
Goldesborough, N. C. ....	89.6	71.5	86.5	68.0	84.7	62.8	80.5	57.1	78.2	58.0	86.1	66.9		
Lumberton, N. C. ....	90.4	60.8	88.8	66.9	83.5	60.3	79.7	54.8	80.8	56.8	86.7	66.1		
New-Berne, N. C. ....	88.5	60.2	85.6	67.1	87.5	64.9	76.6	54.9	79.9	57.8	87.1	65.4		
Raleigh, N. C. ....	89.5	67.9	86.2	66.4	85.1	61.1	78.0	54.4	79.3	56.3	88.3	64.3		
Salisbury, N. C. ....	92.3	68.8	89.5	61.8	80.1	58.4	81.3	49.0	80.9	41.7	90.7	51.6		
Wadesborough, N. C. ....	91.5	68.6	88.8	65.9	86.5	62.2	82.5	55.6	81.7	49.8	90.0	59.2		
Weldon, N. C. ....	88.4	68.1	86.1	67.0	85.1	61.5	77.7	52.3	76.7	58.3	86.6	65.0		
Wilmington, N. C. ....	87.4	72.5	84.6	70.5	83.9	67.5	77.7	60.5	79.0	62.9	84.6	68.0		
Charleston, S. C.:														
Branchville, S. C. ....	90.9	71.9	87.8	69.0	84.9	65.5	80.4	56.8	82.8	60.0	89.2	68.3		
Charleston, S. C. ....	88.9	74.4	85.2	72.7	83.1	71.7	78.0	65.8	79.9	66.4	88.8	73.6		
Hardeeville, S. C. ....	92.7	70.6	89.6	68.7	85.8	63.3	82.4	56.8	84.5	58.7	90.8	69.1		
Jacksonborough, S. C. ....	91.6	75.4	88.6	71.3	85.4	62.8	80.7	55.5	77.4	55.1	83.7	63.5		
Kingstree, S. C. ....	92.1	76.8	89.5	67.3	86.0	63.1	80.6	55.4	82.7	57.8	88.9	64.0		
Saint George's, S. C. ....	93.1	68.8	89.9	66.5	85.8	63.1	81.6	55.1	84.9	55.7	91.4	64.2		
Saint Matthew's, S. C. ....	91.4	71.4	88.5	68.9	85.2	64.9	81.6	58.4	83.2	59.0	90.1	68.1		
Yemassee, S. C. ....	92.0	70.8	89.0	68.4	85.7	64.4	81.1	54.5	83.8	58.4	89.8	67.8		
Augusta, Ga.:														
Allendale, S. C. ....	91.0	63.6	88.8	61.9	85.0	64.8	81.5	60.1	82.9	60.3	89.2	68.5		
Athens, Ga. ....	96.0	69.7	92.3	66.2	87.8	60.1	80.0	59.9	84.6	56.4	94.2	65.6		
Augusta, Ga. ....	89.9	72.9	88.3	70.9	85.2	68.2	81.3	61.2	83.0	60.5	91.0	68.7		
Batesburg, S. C. ....	91.8	70.4	89.7	67.3	86.3	64.7	81.4	58.2	82.8	60.4	91.4	67.2		
Blackville, S. C. ....	92.9	73.0	89.1	68.9	85.5	63.9	81.7	56.8	82.8	58.2	89.9	66.9		
Camak, Ga. ....	94.9	68.6	92.8	66.6	90.7	66.5	85.7	56.8	84.2	55.3	92.9	65.2		
Chester, S. C. ....	92.2	68.6	88.4	66.5	88.3	63.8	83.1	56.1	82.8	58.0	90.3	67.0		
Columbia, S. C. ....	90.4	68.5	88.0	68.0	85.0	64.2	81.2	56.6	80.0	60.2	88.0	63.8		
Greenwood, S. C. ....	89.4	67.9	86.6	64.5	85.0	59.7	80.8	56.9	80.3	57.7	89.0	67.0		
Union Point, Ga. ....									77.5	54.9	85.7	63.8		
Washington, Ga. ....	95.5	69.2	93.4	67.0	93.3	64.8	88.0	57.2	88.5	58.4	91.7	67.8		
Waynesborough, Ga. ....	95.0	71.0	89.2	59.2	85.6	54.9	81.5	48.7	83.8	60.1	91.4	68.8		
Savannah, Ga.:														
Albany, Ga. ....	91.5	73.2	91.1	71.0	90.0	68.0	86.4	59.7	84.3	63.1	91.7	72.4		
Allapaha, Ga. ....	91.7	72.9	88.4	67.1	87.7	66.0	83.8	58.1	80.6	57.9	89.2	67.9		
Bainbridge, Ga. ....	90.3	72.5	90.6	70.2	90.2	67.7	85.5	58.4	83.6	65.1	90.5	70.8		
Cedar Keys, Fla. ....	87.5	76.8	88.1	74.4	86.9	73.6	82.1	67.2	81.7	69.9	87.6	78.5		
Eastman, Ga. ....	92.8	(?)	90.8	(?)	89.7	(?)	84.1	(?)	83.9	59.0	91.9	68.9		
Fernandina, Fla. ....	91.6	71.7	87.9	72.3	(?)	(?)	89.3	73.0	80.1	67.4	88.5	73.9		
Fort Gaines, Ga. ....	91.0	72.2	90.0	68.4	90.8	68.3	86.0	57.4	84.5	59.9	94.4	69.2		
Jesup, Ga. ....	94.5	71.2	91.1	69.7	87.6	66.0	82.4	58.9	83.0	60.5	92.7	69.3		
Live Oak, Fla. ....	94.3	69.7	92.0	67.3	89.9	64.0	85.6	56.6	86.0	60.6	92.0	69.9		
Millen, Ga. ....	94.1	69.2	91.8	68.0	87.9	63.4	84.6	56.7	85.5	59.5	91.1	67.3		
Quitman, Ga. ....	92.6	72.7	91.5	66.4	89.9	66.8	85.5	58.6	86.4	61.3	94.1	69.6		
Savannah, Ga. ....	89.8	76.0	86.2	73.1	83.1	70.4	78.2	63.8	80.9	66.2	86.7	72.8		
Smithville, Ga. ....	94.1	68.0	93.0	67.9	90.3	64.1	85.6	54.1	87.7	61.8	95.1	69.5		
Thomasville, Ga. ....	89.4	72.8	89.0	69.2	88.2	67.4	85.2	59.7	83.3	61.3	90.3	68.2		
Waldo, Fla. ....	89.2	72.7	90.7	70.4	(?)	(?)	85.9	63.8	87.1	58.3	91.6	70.7		
Way Cross, Ga. ....	95.9	70.9	94.5	72.6	90.5	63.2	88.7	64.7	83.5	61.9	91.5	70.4		
Atlanta, Ga.:														
Anderson, S. C. ....	93.8	68.8	91.4	68.7	89.4	63.1	82.5	56.0	83.2	55.2	92.4	65.8		
Atlanta, Ga. ....	85.0	70.6	83.1	67.5	83.6	66.1	77.1	59.5	74.8	59.0	94.0	69.3		
Cartersville, Ga. ....	91.7	67.9	88.9	65.1	88.7	63.7	81.0	54.8	77.1	53.3	90.2	65.7		
Columbus, Ga. ....	89.6	69.2	82.4	70.4	80.6	68.2	84.8	58.5	76.5	49.3	89.0	69.6		

° Twenty-two days only.

° Thirty days only.

° Twenty-eight days only.

° Twenty-seven days only.

° Twenty-six days only.

° Twenty-nine days only.

° No record.

° Twenty-five days only.

° Twenty-three days only.

Mean of the maximum and minimum temperatures at the cotton-region stations of the Signal Service, &c.—Continued.

Stations.	1884.								1885.			
	July.		August.		September.		October.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Atlanta, Ga.—Continued:	o	o	o	o	o	o	o	o	o	o	o	o
Dalton, Ga.	88.7	69.0	87.2	65.0	88.3	63.6	80.1	54.8	80.0	53.6	92.6	65.1
Gainesville, Ga.	83.5	67.2	85.0	65.8	84.7	57.4	77.5	52.2	79.0	53.5	88.4	63.4
Greenville, S. C.	91.7	67.1	87.8	64.9	85.8	61.0	79.6	58.5	81.1	52.5	91.2	64.9
Griffin, Ga.	88.5	70.9	86.1	67.4	86.1	66.4	80.5	59.0	78.5	50.3	86.7	68.8
Macon, Ga.	93.9	71.7	90.0	69.2	89.2	66.2	88.9	58.1	83.3	50.8	91.7	69.6
Newnan, Ga.	91.3	70.6	88.4	66.9	88.6	65.0	82.1	58.1	81.4	58.4	89.9	67.3
Spartanburg, S. C.	92.1	67.4	89.5	65.1	89.0	60.3	83.6	52.8	83.2	45.9	89.6	65.9
Toccoa, Ga.	90.5	66.8	88.0	64.1	86.7	61.0	79.3	52.6	80.5	54.4	89.7	64.2
West Point, Ga.	92.0	71.1	89.5	67.5	89.7	63.0	82.2	56.8	80.3	55.7	89.0	68.1
Montgomery, Ala.:												
Birmingham, Ala.	91.8	68.8	89.9	65.9	88.6	60.3	86.1	67.2	80.4	52.0	90.6	61.7
Calera, Ala.	90.2	62.4	88.2	62.4	90.3	59.3	82.8	48.9	85.6	45.2	95.8	65.0
Ensley, Ala.	91.1	72.1	89.6	69.6	90.2	71.3	85.2	56.5	89.0	50.1	90.4	69.2
Fort Deposit, Ala.	90.4	70.6	88.3	69.2	88.9	64.1	82.7	56.6	81.3	71.0	89.4	71.2
Greenville, Ala.	(*)	(*)	89.3	68.8	90.5	68.6	83.2	58.2	82.0	74.3	89.5	69.0
Marion, Ala.	95.1	72.9	93.2	67.5	94.0	65.9	84.0	57.0	86.4	56.6	90.8	66.2
Montgomery, Ala.	90.9	72.9	88.8	69.5	89.4	66.6	83.0	61.4	80.3	61.5	90.6	70.4
Opelika, Ala.	92.1	69.7	90.0	64.9	88.0	65.0	82.5	55.8	80.6	58.4	89.2	67.4
Pine Apple, Ala.	98.1	70.0	97.1	63.4	90.1	62.6	83.4	52.7	81.8	57.3	93.0	66.2
Selma, Ala.	91.9	65.3	88.6	67.6	89.0	65.0	81.9	57.4	80.1	50.0	90.6	68.6
Mobile, Ala.:												
Abbeville, Miss.	88.5	70.7	86.7	68.6	86.7	65.7	79.0	54.8	81.1	56.1	89.9	68.3
Columbus, Miss.	95.4	70.9	92.7	67.2	92.6	66.4	83.3	56.5	84.0	50.2	95.3	71.6
Evergreen, Ala.	98.9	77.0	98.3	73.9	92.4	70.5	85.2	63.4	(*)	(*)	(*)	(*)
Livingston, Ala.	93.9	72.1	91.5	67.3	91.0	66.0	78.0	55.0	85.0	47.7	94.0	77.0
Macon, Miss.	95.6	72.9	92.4	64.2	90.4	64.4	82.9	55.8	82.8	55.5	95.0	68.2
Meridian, Miss.	96.1	71.5	92.5	68.4	92.2	64.4	79.3	54.8	82.5	61.5	93.7	71.1
Mobile, Ala.	89.7	73.7	88.9	71.2	87.5	71.0	82.5	62.6	80.2	64.1	85.2	71.0
Okolona, Miss.	90.7	70.6	88.7	68.7	92.6	65.4	84.4	55.2	84.2	53.3	92.9	73.9
Waynesborough, Miss.	93.6	71.1	92.3	67.4	91.3	65.0	88.7	58.2	83.7	60.1	91.3	69.1
New Orleans, La.:												
Alexandria, La.	95.7	71.8	92.5	68.6	91.0	67.0	81.0	59.0	81.1	62.4	92.2	68.7
Amite City, La.	94.9	72.5	93.6	68.2	91.6	65.2	85.7	58.3	83.8	58.5	91.6	68.2
Brookhaven, Miss.	94.5	73.2	90.9	67.2	90.8	66.8	83.8	58.1	83.4	58.5	94.0	67.5
Cheneyville, La.	95.8	73.1	91.9	67.5	90.8	66.6	81.7	53.7	84.2	61.5	95.2	68.2
Conshatka Chute, La.	97.4	73.9	94.8	68.0	93.0	68.0	78.0	57.0	80.5	54.7	89.8	68.5
Halehurst, La.	97.5	80.8	93.2	70.4	92.7	65.3	84.9	57.8	83.1	60.4	99.1	68.3
Lafayette, La.	92.5	74.4	91.3	70.2	91.0	70.0	82.9	60.7	82.5	54.6	91.6	70.6
Minden, La.	100.1	73.2	95.2	68.4	93.5	69.2	81.8	56.7	83.9	57.6	94.3	68.3
Natchez, Miss.	92.3	75.2	89.6	70.3	88.9	70.5	80.1	61.2	83.0	61.0	92.2	69.2
Natchitoches, La.	90.5	76.8	90.0	70.6	87.6	70.5	77.9	59.5	80.8	60.5	91.2	69.6
New Orleans, La.	90.8	77.8	88.1	74.4	86.8	73.9	80.3	67.4	80.5	63.4	89.0	73.8
Opelousas, La.	98.6	70.1	93.8	66.7	93.7	67.3	84.0	59.6	84.2	62.6	95.1	69.1
Shreveport, La.	99.1	77.0	94.7	72.1	91.9	71.6	77.5	58.6	83.6	62.3	93.4	72.3
Whiteville, La.	94.5	74.6	91.9	69.1	91.0	68.5	82.3	59.9	82.3	62.3	(*)	(*)
Galveston, Tex.:												
Austin, Tex.	100.0	74.0	96.9	72.9	94.8	72.3	(*)	(*)	(*)	(*)	95.1	72.2
Beaumont, Tex.	(*)	(*)	94.3	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)
Belton, Tex.	98.7	(*)	96.2	(*)	94.2	(*)	(*)	(*)	80.9	57.5	92.9	54.3
Columbia, Tex.	92.8	73.6	91.5	71.0	89.7	70.7	(*)	(*)	82.2	66.4	88.7	72.8
Corpus Christi, Tex.	99.3	74.4	96.2	70.1	94.6	71.8	(*)	(*)	83.1	53.7	94.8	67.7
Cuero, Tex.	99.5	74.8	96.4	72.7	93.0	71.0	(*)	(*)	86.5	54.5	97.0	72.0
Dallas, Tex.	100.8	75.7	96.1	71.6	91.0	72.0	80.0	57.0	83.5	(*)	94.1	67.4
Galveston, Tex.	90.6	80.4	89.1	78.7	87.2	79.0	79.7	69.9	81.3	70.6	88.7	79.0
Hearne, Tex.	97.7	73.0	94.5	69.5	91.3	68.3	(*)	(*)	83.2	59.3	93.4	69.7
Hempstead, Tex.	95.1	75.7	91.5	75.2	90.1	79.5	(*)	(*)	(*)	(*)	(*)	(*)
Houston, Tex.	94.7	74.4	95.3	70.8	89.4	70.4	78.2	61.0	82.1	65.1	89.5	71.3
Huntsville, Tex.	97.1	75.1	95.5	71.1	92.6	71.1	(*)	(*)	82.2	61.7	92.7	70.9
Longview, Tex.	99.9	76.7	98.4	68.0	90.6	66.4	(*)	(*)	82.2	(*)	90.3	64.4
Luling, Tex.	(*)	(*)	98.7	74.2	94.1	75.5	83.5	63.5	(*)	(*)	92.2	78.6
Orange, Tex.	101.5	78.2	102.5	78.0	100.2	77.0	85.0	62.0	83.8	60.0	90.8	79.3
Palestine, Tex.	93.9	74.3	91.4	70.3	90.3	70.7	77.0	59.1	79.5	61.3	89.4	70.9
San Antonio, Tex.	95.2	75.0	92.4	73.5	89.4	70.4	78.7	64.0	81.2	63.6	91.4	71.1
Sour Lake, Tex.	96.3	77.1	94.3	76.7	91.7	77.3	81.8	58.4	84.4	64.3	90.1	68.7
Tyler, Tex.	97.8	73.7	93.7	69.5	92.5	71.0	(*)	(*)	82.5	58.0	93.6	68.8
Waco, Tex.	100.3	77.0	97.5	73.1	94.0	74.0	(*)	(*)	82.0	61.0	92.6	71.7
Weatherford, Tex.	98.5	71.4	94.8	72.1	92.6	72.8	(*)	(*)	75.8	55.3	88.0	58.0
Weimar, Tex.	97.9	77.4	92.5	74.4	92.8	76.2	82.4	63.0	83.7	63.1	94.0	71.8

\* No record.

† Twenty-nine days only.

‡ Twenty days only.

§ Twenty-seven days only.

|| Twenty-eight days only.

¶ Twenty-five days only.

\* No record.

† Twenty-four days only.

‡ Observations discontinued.

§ Twenty days only.

|| Record incomplete.

†† Seventeen days only.

‡‡ Eighteen days only.

§§ Twenty-six days only.

||| Twenty-three days only.

¶¶ Sixteen days only.

Mean of the maximum and minimum temperatures at the cotton-region stations of the Signal Service, &c.—Continued.

Stations.	1884.								1885.			
	July.		August.		September.		October.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Vicksburg, Miss. :	o	o	o	o	o	o	o	o	o	o	o	o
Edwards, Miss. ....	93.9	73.7	91.4	70.2	93.2	68.3	82.4	59.8	83.2	61.2	92.9	71.0
Jackson, Miss. ....	96.5	72.1	91.1	85.1	92.2	66.7	80.6	57.6	84.2	59.2	94.1	62.4
Lake, Miss. ....	13.6	69.7	90.0	85.3	89.6	63.7	82.1	52.8	82.3	54.2	92.9	58.8
Monroe, La. ....	98.0	74.8	90.3	69.4	90.2	68.3	80.5	57.4	80.1	60.9	91.2	70.3
Vicksburg, Miss. ....	93.7	74.8	90.5	69.8	89.9	70.0	80.8	61.0	81.2	61.5	91.6	74.2
Little Rock, Ark. :												
Arkansas City, Ark. ....	94.8	73.6	90.1	68.5	87.1	63.7	(*)	(*)	(*)	(*)	(*)	(*)
Brinkley, Ark. ....	96.1	(*)	82.3	(*)	48.4	(*)	78.6	(*)	81.9	55.5	91.6	66.2
Devall's Bluff, Ark. ....	91.0	68.8	88.0	64.5	88.6	63.7	78.4	51.4	79.2	52.8	89.5	63.1
Fort Smith, Ark. ....	96.7	72.1	90.1	68.0	92.2	68.4	79.3	55.0	76.8	56.7	86.3	67.9
Helena, Ark. ....	91.1	71.5	88.5	67.2	84.2	64.9	74.3	55.3	80.2	57.1	91.6	68.8
Kensett, Ark. ....	93.4	69.0	89.5	65.7	87.7	63.4	75.0	52.0	73.1	56.7	83.1	67.2
Little Rock, Ark. ....	93.3	72.9	83.8	65.4	86.5	67.6	75.8	57.5	77.9	60.1	89.0	71.8
Madison, Ark. ....	97.0	69.0	94.6	64.7	(*)	(*)	75.6	53.4	83.0	63.6	91.5	65.6
Magnolia, Ark. ....	96.7	74.2	89.0	74.0	92.0	71.2	80.5	62.6	83.8	56.0	93.7	69.2
Malvern, Ark. ....	98.1	70.8	91.7	67.4	80.2	63.7	82.7	58.2	82.0	61.8	94.4	66.9
Monticello, Ark. ....	93.9	72.1	91.1	65.4	100.6	106.3	77.6	54.6	79.8	57.0	92.1	66.7
Newport, Ark. ....	93.9	55.6	89.4	52.6	87.4	52.1	74.4	42.3	49.1	47.4	93.5	67.0
Paris, Tex. ....	98.2	71.5	93.5	66.6	91.7	67.6	(*)	(*)	80.1	53.0	90.4	64.2
Pine Bluff, Ark. ....	93.6	75.6	88.8	75.0	89.6	70.3	75.3	45.3	78.9	51.1	90.1	65.9
Prescott, Ark. ....	97.5	61.2	101.6	56.1	90.5	56.3	77.6	43.7	48.1	44.6	93.4	61.5
Russellville, Ark. ....	103.6	104.7	91.2	66.4	89.0	68.7	(*)	(*)	75.8	56.6	90.9	47.4
Texarkana, Ark. ....	95.5	65.2	92.3	61.0	90.7	61.9	78.0	48.0	81.9	45.8	88.9	67.1
Memphis, Tenn. :												
Batesville, Miss. ....	95.3	71.0	92.4	68.7	91.8	66.4	81.6	54.3	81.0	56.4	83.8	68.3
Bolivar, Tenn. ....	89.8	70.8	87.8	65.0	88.0	64.9	(*)	(*)	76.6	54.7	87.0	66.9
Brownsville, Tenn. ....	91.3	70.2	88.5	66.3	87.8	66.1	78.1	58.6	79.2	57.8	89.1	67.6
Corinth, Miss. ....	92.2	68.8	89.1	65.5	89.6	64.2	80.2	53.5	80.1	54.2	88.2	67.9
Covington, Tenn. ....	92.9	69.4	89.7	63.6	87.9	63.2	77.6	52.3	79.1	55.7	89.4	67.1
Decatur, Ala. ....	92.8	69.0	89.5	65.1	89.7	63.3	80.5	55.0	80.4	54.8	91.9	65.7
Dyersburg, Tenn. ....	93.4	68.2	89.8	62.7	87.9	63.8	76.2	52.2	76.3	55.2	86.3	66.3
Grand Junction, Tenn. ....	90.3	68.9	88.6	64.1	88.3	64.6	79.0	54.6	77.3	56.4	88.3	67.3
Grenada, Miss. ....	103.4	1170.5	89.7	66.2	90.1	64.3	80.3	53.6	84.5	52.1	93.2	59.3
Hernando, Miss. ....	95.9	65.8	93.7	62.3	91.3	61.7	80.2	56.0	82.9	56.8	94.0	80.4
Holly Springs, Miss. ....	90.0	70.5	87.1	67.4	85.0	67.0	77.4	57.1	77.9	59.3	89.1	70.3
Memphis, Tenn. ....	90.9	73.9	86.9	70.4	86.3	69.2	75.5	58.6	77.6	56.7	89.0	70.7
Milan, Tenn. ....	92.1	68.3	88.8	63.8	87.6	63.9	77.0	53.2	80.7	55.1	92.1	66.7
Nashville, Tenn. ....	87.2	70.4	85.8	66.5	84.8	65.3	75.8	56.7	75.1	57.3	84.3	68.5
Oxford, Miss. ....	92.1	68.7	88.1	61.2	87.4	65.4	78.8	55.4	79.4	56.6	90.7	68.3
Paris, Tenn. ....	89.9	67.5	87.1	62.6	86.1	62.5	75.5	51.8	73.4	47.9	87.4	57.1
Scottsborough, Ala. ....	89.3	66.9	87.5	63.3	88.0	61.1	80.1	53.0	77.7	55.8	87.3	63.7
Tusculumbia, Ala. ....	90.3	68.2	88.6	64.7	88.9	62.9	81.1	54.7	77.9	54.6	90.1	65.6
Withe, Tenn. ....	(*)	(*)	92.9	63.7	92.5	63.0	81.7	52.9	79.9	64.1	89.8	63.2

<sup>1</sup> No record.

<sup>2</sup> Twenty-seven days only.

<sup>3</sup> Thirty days only.

<sup>4</sup> Twenty-nine days only.

<sup>5</sup> Twenty-eight days only.

<sup>6</sup> Record incomplete.

<sup>7</sup> Twenty-three days only.

<sup>8</sup> Twenty-six days only.

<sup>9</sup> Twenty-four days only.

<sup>10</sup> Seventeen days only.

<sup>11</sup> Twenty-five days only.

<sup>12</sup> Nineteen days only.



## APPENDIX 23.

*Mean temperature (in degrees Fahrenheit) at 7 a. m., 3 and 11 p. m. (Washington time), at from January 1, 1880,*

Stations.	January.			February.			March.			April.			May.		
	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.
<b>New England:</b>	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Eastport, Me. ....	16.9	23.0	19.5	20.5	26.6	22.7	25.0	31.5	27.3	35.4	42.1	35.9	45.4	51.0	44.0
Portland, Me. ....	20.7	29.3	23.7	24.8	33.4	28.0	30.4	38.7	32.8	41.0	50.4	42.6	52.0	60.6	52.7
Mount Washington, N. H. ....	5.8	6.8	5.7	8.5	9.6	8.1	8.5	11.2	9.0	18.4	22.4	19.5	32.0	36.9	33.0
Boston, Mass. ....	23.2	30.6	25.4	26.5	35.1	28.5	30.9	38.2	32.5	40.8	48.4	41.6	53.2	59.9	52.8
New Haven, Conn. ....	23.0	21.0	25.6	27.0	35.2	29.5	31.0	39.9	33.3	41.9	50.9	42.9	54.4	63.3	54.1
New London, Conn. ....	25.4	32.7	28.0	29.2	36.3	30.9	33.3	39.9	34.3	43.5	49.9	42.7	55.6	60.4	53.4
<b>Middle Atlantic States:</b>															
Albany, N. Y. ....	22.1	28.5	24.3	27.0	34.0	29.0	31.8	38.8	33.8	44.0	53.3	45.9	57.7	67.4	58.5
New York City. ....	27.3	33.5	29.3	30.7	37.6	32.4	33.5	41.6	35.0	43.3	52.3	45.3	55.5	65.1	57.3
Philadelphia, Pa. ....	28.8	34.9	31.5	33.9	41.5	36.1	36.3	44.9	39.9	44.5	56.0	48.0	57.7	70.3	60.0
Atlantic City, N. J. ....	29.8	35.8	31.6	33.1	39.3	34.8	35.7	42.9	37.3	44.7	56.0	44.9	56.4	61.5	55.8
Barnegat City, N. J. ....	29.5	35.0	31.1	32.8	38.5	34.0	35.6	42.1	37.7	44.9	56.4	44.9	56.8	60.0	55.0
Cape May, N. J. ....	32.6	37.3	34.6	36.5	42.1	38.4	38.9	44.3	40.9	46.6	53.2	49.4	57.7	66.3	58.4
Sandy Hook, N. J. ....	28.6	33.5	30.2	31.9	37.6	32.9	34.8	41.3	36.7	44.0	51.8	45.5	56.8	60.4	53.7
Baltimore, Md. ....	31.3	38.1	33.9	36.2	44.3	36.5	38.3	47.3	41.8	48.6	58.5	51.3	60.0	72.7	63.1
Washington City. ....	28.9	36.7	31.5	34.2	44.2	37.0	38.6	47.4	40.9	48.6	58.9	49.7	58.7	73.2	62.0
Cape Henry, Va. ....	37.9	42.4	39.6	42.5	48.4	44.3	43.7	50.1	45.4	51.2	62.8	63.2	62.7	70.4	62.8
Lynchburg, Va. ....	33.5	42.6	36.4	38.7	50.3	42.3	43.0	52.9	44.4	50.9	63.4	54.4	63.9	76.0	64.9
Norfolk, Va. ....	38.1	44.2	39.2	42.7	52.1	45.1	44.0	53.3	46.6	52.4	61.5	53.0	64.3	74.4	64.0
<b>South Atlantic States:</b>															
Charlotte, N. C. ....	37.2	46.4	41.0	42.5	54.7	47.7	44.8	57.2	49.1	52.9	66.2	57.3	63.8	76.5	66.8
Kitty Hawk, N. C. ....	40.5	44.4	41.5	44.5	50.0	45.7	45.0	51.2	46.5	51.3	57.7	51.9	62.4	70.0	62.0
Smithville, N. C. ....	43.9	51.2	46.5	48.1	50.7	51.0	49.7	58.6	53.4	56.8	64.9	58.8	67.0	75.4	68.2
Wilmington, N. C. ....	44.4	53.9	48.7	48.3	60.4	51.8	50.0	61.3	53.8	57.7	67.0	63.9	66.4	76.7	67.5
Charleston, S. C. ....	47.8	56.1	50.8	51.7	61.9	55.1	53.5	64.6	57.5	60.9	69.9	62.9	69.9	77.7	70.9
Augusta, Ga. ....	43.6	55.2	47.7	48.0	63.5	53.3	50.0	65.9	56.1	57.7	67.2	62.3	65.9	81.1	70.0
Savannah, Ga. ....	48.4	58.7	52.2	52.0	64.2	56.5	54.0	67.7	59.6	62.2	72.8	65.0	70.0	79.9	71.4
Jacksonville, Fla. ....	52.5	64.0	55.6	55.9	68.5	59.7	58.6	71.1	62.4	64.9	76.5	67.3	72.4	80.7	71.9
<b>Florida Peninsula:</b>															
Cedar Keys, Fla. ....	54.5	62.4	57.6	58.5	68.9	61.6	60.4	68.9	64.1	67.0	75.3	69.3	72.6	81.2	74.1
Key West, Fla. ....	69.1	75.5	70.8	70.7	76.8	72.0	71.4	78.0	72.4	75.0	81.6	75.1	78.7	83.7	77.8
<b>Eastern Gulf States:</b>															
Atlanta, Ga. ....	39.6	48.5	44.2	44.4	55.4	50.1	46.9	59.5	52.7	55.1	67.5	60.4	63.3	75.9	68.1
Pensacola, Fla. ....	50.1	58.6	53.5	53.7	63.6	57.8	57.0	67.4	61.0	64.1	73.1	66.7	70.3	79.4	72.1
Montgomery, Ala. ....	44.3	55.1	49.2	48.8	62.1	54.3	51.5	66.0	57.6	58.9	73.7	64.0	68.5	81.3	71.0
Vicksburg, Miss. ....	44.4	53.0	48.3	49.3	60.8	54.4	53.1	66.1	59.0	59.6	73.9	65.5	69.8	81.1	71.4
New Orleans, La. ....	52.2	60.4	55.2	56.5	65.5	59.6	59.5	68.9	63.4	66.0	75.0	69.0	72.4	80.2	74.3
<b>Western Gulf States:</b>															
Shreveport, La. ....	41.7	52.1	46.5	47.1	57.6	51.7	51.9	65.7	58.8	59.4	74.7	65.5	67.1	81.0	72.0
Little Rock, Ark. ....	37.8	47.5	42.2	43.4	52.6	48.1	48.2	59.8	54.2	56.0	69.6	62.5	64.7	77.1	68.9
Galveston, Tex. ....	51.0	56.0	53.8	55.7	61.3	58.0	61.3	68.7	62.3	67.7	78.4	69.7	73.5	79.7	75.5
Indianola, Tex. ....	49.7	57.0	52.4	55.4	61.9	57.9	56.1	68.3	62.6	67.7	75.5	69.8	73.2	80.5	75.5
<b>Rio Grande Valley:</b>															
Brownsville, Tex. ....	53.7	65.2	56.9	58.4	69.0	61.1	64.3	75.1	67.0	69.7	80.5	72.3	74.8	85.1	76.7
<b>Ohio Valley and Tennessee:</b>															
Chattanooga, Tenn. ....	37.6	46.2	42.0	43.2	53.2	47.7	45.9	57.5	51.1	54.3	67.3	58.5	62.0	76.6	66.0
Knoxville, Tenn. ....	34.2	44.2	38.6	39.8	51.7	44.8	44.1	54.9	48.3	51.1	65.7	55.9	60.0	75.9	64.6
Memphis, Tenn. ....	36.5	45.1	40.7	41.6	51.6	47.1	47.0	56.7	50.2	53.6	68.0	61.6	65.5	77.2	69.1
Nashville, Tenn. ....	35.2	44.3	39.4	40.9	51.2	45.2	44.4	55.3	48.5	51.3	66.6	58.8	63.1	77.7	67.5
Louisville, Ky. ....	32.6	39.3	35.1	38.0	46.4	41.8	40.0	50.0	44.9	47.8	62.0	55.3	59.3	74.1	65.3
Indianapolis, Ind. ....	26.2	33.5	28.7	31.0	39.8	35.7	34.9	45.6	39.7	42.6	58.0	51.2	58.8	70.7	62.5
Cincinnati, Ohio. ....	31.2	38.9	34.3	36.9	45.3	40.9	39.9	54.9	48.1	51.0	66.0	58.8	62.9	77.2	64.6
Columbus, Ohio. ....	28.3	33.9	29.5	32.3	39.3	36.0	34.4	43.7	39.0	44.6	56.6	49.3	56.9	70.0	61.5
Pittsburg, Pa. ....	28.6	34.8	31.6	32.7	40.6	36.0	34.0	43.8	38.0	44.5	57.9	48.5	56.2	72.3	60.7
<b>Lower Lakes:</b>															
Buffalo, N. Y. ....	22.5	26.0	23.6	24.1	29.3	26.4	28.0	32.3	28.8	37.2	44.3	39.3	50.8	57.3	52.6
Oswego, N. Y. ....	23.6	28.1	25.6	26.4	31.6	28.8	29.3	33.3	30.1	33.9	44.4	35.1	43.2	58.5	54.2
Erie, Pa. ....	25.1	29.9	27.0	27.8	33.2	30.8	30.0	35.6	33.4	41.1	46.7	42.8	55.1	61.1	56.2
Cleveland, Ohio. ....	23.5	28.7	25.2	27.9	33.2	30.8	30.0	35.6	33.4	41.1	46.7	42.8	55.1	61.1	56.2
Toledo, Ohio. ....	24.2	31.1	28.5	28.6	35.3	32.2	31.0	40.0	37.2	45.9	51.9	46.1	56.3	66.2	58.8
Detroit, Mich. ....	23.4	28.9	25.0	28.0	34.5	30.8	30.0	38.9	33.9	41.1	46.7	42.8	55.1	61.1	56.2

## APPENDIX 23.

stations of the Signal Service, United States Army, for each month of the year. (Computed to December 31, 1884.)

June.			July.			August.			September.			October.			November.			December.		
7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.
54.8	62.1	51.8	59.1	66.0	56.3	59.2	67.0	57.3	54.4	61.1	53.8	44.7	50.4	45.0	34.8	38.8	35.4	24.3	28.4	25.6
61.8	71.1	62.0	66.3	75.9	66.6	65.1	74.9	66.0	58.8	67.9	60.3	47.1	56.6	49.2	36.5	44.3	38.8	27.7	33.6	29.6
42.5	47.7	42.7	44.8	49.9	45.4	45.1	50.4	46.3	41.2	45.1	41.6	29.0	32.1	29.5	16.3	18.2	17.2	10.2	11.5	10.9
63.4	71.5	62.4	67.1	75.6	67.0	65.6	75.0	65.9	60.0	69.4	61.2	48.1	57.1	49.8	36.6	45.3	38.7	28.4	34.9	30.3
64.2	73.5	62.9	68.2	76.8	67.8	65.8	76.2	66.5	60.7	71.7	62.6	48.6	59.7	50.7	36.7	45.7	33.7	27.8	34.9	30.4
64.8	70.2	62.3	69.2	74.7	67.3	67.5	73.9	68.4	62.6	69.9	62.7	51.3	29.3	52.1	39.0	46.7	41.1	30.1	36.5	32.3
67.0	76.6	66.6	70.4	79.2	70.1	67.9	78.7	69.3	61.9	72.4	63.5	48.9	58.9	51.3	37.9	45.2	40.0	28.7	33.4	30.3
64.9	74.1	65.7	69.3	78.2	70.3	67.8	77.4	69.5	63.4	73.5	65.5	52.3	61.7	54.7	39.9	47.5	42.1	31.3	37.0	33.1
67.2	78.4	68.7	70.9	81.7	72.8	70.0	80.0	71.1	64.5	76.4	67.1	53.2	63.0	56.0	40.9	49.0	43.6	32.6	39.1	34.9
65.5	70.7	64.4	67.5	77.3	70.0	69.5	75.5	69.9	66.2	73.1	67.0	55.7	62.7	56.9	41.3	49.2	43.4	33.1	39.4	35.1
66.4	69.7	63.6	67.1	75.5	69.5	67.0	72.1	69.0	66.6	71.4	66.2	55.5	61.3	56.9	41.8	48.8	43.3	33.3	39.1	34.7
64.4	72.4	66.7	71.7	77.9	70.7	67.1	76.7	71.1	67.6	74.0	68.7	58.0	64.3	59.6	45.3	51.6	47.2	36.5	42.9	38.7
66.1	74.1	66.4	67.8	78.8	72.4	69.5	78.7	71.0	65.7	74.1	67.2	55.0	62.3	56.6	42.4	48.6	44.4	33.0	38.0	34.7
69.1	79.9	70.9	73.0	83.5	74.1	70.2	81.5	72.4	65.3	77.2	68.2	54.9	66.0	57.6	42.1	50.8	44.9	34.3	41.6	37.0
68.7	80.4	69.9	71.5	84.2	72.8	69.3	82.6	71.2	64.3	78.8	67.3	53.3	67.2	59.6	39.6	51.0	43.1	31.5	40.6	34.5
70.8	78.7	70.3	74.8	85.6	74.7	71.3	81.2	73.6	70.4	78.7	71.0	61.1	69.0	63.4	49.3	56.1	51.0	40.8	46.3	42.7
71.9	81.8	71.6	73.9	82.8	74.7	71.0	83.7	73.4	63.5	79.6	68.2	55.0	69.5	58.9	41.3	53.9	44.4	34.9	45.6	37.7
73.0	81.1	71.6	76.8	84.7	75.1	74.6	81.9	73.6	69.6	79.2	70.4	60.0	69.2	61.9	47.6	56.3	50.3	39.9	47.9	42.6
72.0	82.3	73.9	74.9	86.0	77.3	71.8	86.6	75.7	55.2	77.3	68.9	55.0	69.2	61.9	43.5	56.3	48.4	37.7	48.7	41.9
71.4	78.3	70.8	76.6	80.7	75.4	74.6	79.8	74.4	71.5	78.5	71.9	63.3	69.2	63.8	51.3	57.2	52.7	42.8	47.9	44.5
74.6	81.5	75.0	78.2	85.1	78.7	75.7	83.1	77.5	71.5	79.2	73.9	62.9	71.8	65.8	49.9	60.3	53.5	44.3	53.1	47.5
74.3	82.5	74.7	77.0	85.2	77.4	74.7	83.7	76.3	70.6	80.4	72.8	62.0	73.7	65.2	49.8	62.4	53.7	43.9	55.7	47.9
77.0	84.5	77.1	79.9	87.6	80.4	77.1	85.5	79.1	73.0	81.8	75.6	65.6	74.7	67.8	53.5	63.3	57.0	48.2	57.6	51.5
73.2	86.8	76.2	76.4	89.9	79.4	73.8	87.4	77.5	69.5	83.8	73.5	61.5	77.1	64.4	47.9	63.3	52.3	43.5	57.2	48.7
77.3	86.0	77.5	80.5	88.6	80.6	77.3	85.8	78.5	72.5	82.2	75.1	64.8	75.5	68.3	52.3	65.1	57.2	48.7	60.2	52.7
78.7	85.6	77.5	80.5	88.4	79.5	78.3	86.3	78.3	73.6	83.7	75.7	68.9	78.8	70.6	57.4	68.8	60.9	52.4	64.4	56.0
78.3	84.9	78.8	80.7	86.5	80.9	78.8	86.6	79.7	75.4	85.1	78.3	70.1	79.4	72.8	60.1	69.5	63.1	55.2	63.9	58.2
82.4	87.6	80.9	83.7	89.4	82.8	82.3	88.1	82.1	80.6	86.3	81.1	77.5	82.4	78.3	73.8	78.5	74.7	69.2	74.4	70.6
71.0	81.3	73.8	73.5	85.0	77.1	70.7	82.4	74.4	66.0	79.0	71.2	58.9	72.1	64.2	45.4	57.5	50.6	40.1	50.8	44.5
77.1	84.2	77.9	78.2	85.6	79.3	76.5	85.4	78.9	72.7	83.1	76.0	67.1	77.8	70.6	54.0	65.6	57.7	50.6	59.9	54.0
73.8	86.8	76.8	75.9	89.0	79.1	73.8	87.4	77.7	68.6	85.0	74.4	62.6	78.2	68.3	48.1	62.6	53.4	44.6	56.9	49.1
74.0	88.2	77.4	75.5	89.7	78.7	73.4	89.8	77.7	68.2	84.4	73.5	62.5	77.2	67.1	48.8	61.3	52.8	45.7	56.8	50.5
78.4	85.1	79.8	80.1	87.1	81.8	78.7	86.3	80.9	75.1	83.7	77.9	69.6	78.0	72.1	57.0	65.4	58.9	53.5	61.5	56.1
74.1	89.4	79.2	76.3	91.9	81.0	73.9	91.0	79.8	68.4	84.7	74.1	61.5	77.1	66.6	47.1	60.0	52.7	43.8	55.2	48.4
72.0	84.9	76.8	74.1	86.9	79.1	72.3	86.2	77.5	65.9	80.3	71.5	59.8	72.2	64.4	45.1	58.6	49.8	40.0	49.9	44.4
79.8	86.2	81.2	81.2	87.9	82.8	80.5	86.9	82.6	77.5	88.1	79.7	72.2	77.5	74.3	58.6	63.8	61.1	55.1	60.1	57.3
78.5	86.9	80.5	79.7	88.4	81.4	78.7	87.2	81.0	76.1	83.1	78.9	71.2	78.7	74.1	61.5	64.8	61.0	53.7	60.7	56.0
78.2	88.6	81.0	78.8	89.9	81.6	76.7	89.6	80.3	74.3	86.2	77.7	71.1	81.7	73.8	59.9	70.4	63.1	56.6	66.8	59.2
70.0	82.6	72.4	72.1	85.5	75.0	70.3	83.6	73.9	64.5	79.5	69.2	57.6	71.7	62.0	43.3	56.0	48.0	38.3	47.6	41.4
67.7	81.0	71.0	69.8	82.8	72.8	68.0	83.3	71.8	62.9	79.8	67.9	54.9	72.4	59.9	40.1	54.6	45.0	34.1	45.3	37.5
72.2	83.8	74.9	74.4	85.7	77.4	73.4	86.4	76.9	68.4	80.1	71.4	59.7	71.8	64.1	44.3	55.2	46.8	38.9	47.6	43.2
71.4	83.5	73.8	72.6	85.7	76.2	71.2	85.3	75.7	64.7	79.6	70.0	58.0	71.0	62.6	42.0	54.5	47.2	37.0	45.9	40.3
69.8	80.3	72.0	72.2	84.0	75.3	69.5	84.0	74.6	63.8	78.6	68.8	55.7	67.6	59.5	41.6	51.1	45.2	35.6	41.4	37.9
68.2	78.6	70.7	70.6	81.9	73.8	67.9	81.8	72.5	66.1	77.5	66.2	51.6	68.5	61.8	36.2	46.0	40.1	28.9	35.2	31.3
69.0	79.8	72.5	71.6	83.4	76.1	69.5	82.8	74.7	64.4	77.8	69.5	55.2	66.2	59.1	40.4	50.1	43.8	33.7	40.7	36.1
66.0	77.3	69.2	68.4	81.4	72.5	66.0	80.4	71.1	60.8	75.7	65.8	51.0	63.1	55.2	36.2	45.9	40.2	29.9	35.5	32.0
65.0	78.8	68.0	66.6	81.7	70.0	64.5	81.9	69.5	60.8	77.3	65.5	51.6	61.6	54.7	38.5	47.6	41.1	31.6	37.6	33.0
61.1	67.8	62.3	65.4	71.7	67.1	64.7	73.7	67.0	60.3	69.1	62.3	48.5	55.9	50.0	36.5	41.5	37.5	28.9	31.8	29.5
61.5	67.6	62.0	66.5	71.9	67.6	65.4	72.9	67.4	60.1	68.2	62.4	48.3	55.6	50.4	37.1	42.0	38.7	28.0	32.0	29.7
64.7	70.0	64.8	68.4	73.8	68.8	67.0	74.2	67.9	61.9	69.4	63.4	45.1	58.7	53.3	38.4	43.7	39.8	30.6	34.4	31.9
63.9	71.1	65.7	67.2	74.9	69.1	65.1	74.8	68.3	61.1	70.7	63.7	50.2	58.2	52.9	38.1	42.9	38.1	28.5	32.4	29.3
66.0	74.3	67.7	69.0	79.0	71.3	66.6	77.5	70.2	61.2	72.4	65.0	50.5	60.0	54.0	37.1	44.8	39.7	29.4	34.2	31.0
63.4	72.8	66.3	65.9	78.1	69.6	65.0	76.6	68.3	60.3	71.4	63.8	50.8	58.0	53.5	37.6	43.6	39.5	29.6	33.9	31.0

*Mean temperature (in degrees Fahrenheit) at 7 a. m. 3 and 11 p. m.*

Stations.	January.			February.			March.			April.			May.		
	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.
Upper Lakes:	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
Alpena, Mich. ....	14.6	22.7	16.6	15.3	24.6	18.9	19.2	29.2	23.9	32.9	40.8	34.0	16.9	53.5	47.3
Escanaba, Mich. ....	9.8	18.9	13.3	11.0	22.0	15.9	16.3	29.4	21.9	31.5	41.6	34.0	16.7	55.7	47.9
Grand Haven, Mich. ....	23.3	27.7	24.7	24.8	31.0	28.0	28.5	35.2	31.7	39.6	47.1	42.8	53.5	59.9	54.7
Marquette, Mich. ....	13.7	20.4	15.5	13.7	22.4	16.9	19.4	28.2	23.0	33.6	40.6	35.2	47.8	53.2	47.6
Port Huron, Mich. ....	18.6	25.3	20.6	22.3	29.3	25.1	25.8	32.4	28.7	37.7	43.9	38.6	50.5	58.7	50.6
Chicago, Ill. ....	22.1	27.9	24.0	25.8	33.4	20.6	31.2	38.2	35.0	41.8	48.6	45.5	54.5	60.9	56.0
Milwaukee, Wis. ....	17.3	23.4	20.5	22.0	29.0	26.3	27.7	34.1	31.7	38.8	45.5	42.6	51.5	57.4	53.7
Duluth, Minn. ....	5.4	14.4	10.1	9.8	20.2	15.7	18.4	29.5	24.7	33.6	42.0	37.7	45.0	52.4	47.6
Upper Mississippi Valley:															
Saint Paul, Minn. ....	8.2	16.8	12.3	13.0	23.9	18.2	23.1	34.2	28.5	38.2	51.7	44.8	51.5	66.3	57.5
La Crosse, Wis. ....	11.8	20.4	15.7	17.1	27.5	23.6	25.7	35.6	31.7	40.9	52.6	47.4	55.1	66.4	60.6
Davenport, Iowa. ....	18.8	26.9	23.1	23.8	33.8	29.1	30.3	40.5	35.5	43.4	55.9	49.2	56.4	68.5	61.1
Des Moines, Iowa. ....	5.6	24.9	20.5	20.4	31.3	25.7	28.8	40.1	33.8	41.8	56.4	48.6	54.3	68.5	60.0
Dubuque, Iowa. ....	13.8	23.9	19.4	19.0	30.9	25.3	27.2	33.8	33.1	40.9	54.9	47.5	54.4	67.9	59.4
Keokuk, Iowa. ....	20.7	28.6	24.2	25.8	35.5	30.6	32.3	43.4	37.1	45.4	58.8	51.1	58.0	70.4	62.1
Cairo, Ill. ....	32.3	39.8	35.5	38.9	46.1	42.4	42.8	52.2	47.9	53.8	64.0	58.7	63.2	74.0	67.0
Springfield, Ill. ....	25.1	31.2	27.0	30.2	38.2	33.7	35.3	45.1	39.6	47.1	59.2	52.5	55.7	69.0	63.6
Saint Louis, Mo. ....	26.5	33.3	29.4	31.9	40.4	35.8	36.7	47.6	42.0	48.6	61.7	54.4	58.9	72.5	64.3
Missouri Valley:															
Leavenworth, Kans. ....	22.0	31.8	27.0	26.3	38.0	32.1	34.5	47.8	40.7	46.7	61.3	53.2	58.0	71.1	63.7
Omaha, Nebr. ....	15.5	25.5	20.7	19.9	30.4	25.4	28.9	40.0	34.5	43.0	56.8	49.9	56.6	69.0	61.7
Yankton, Dak. ....	10.2	22.4	15.0	13.1	24.4	18.8	23.5	35.9	29.0	38.0	52.4	44.4	53.3	67.6	58.1
Extreme Northwest:															
Bismarck, Dak. ....	0.9	10.7	4.4	5.4	17.5	9.8	15.4	27.5	20.7	31.6	46.3	37.4	47.5	64.2	53.8
Buford, Fort, Dak. ....	0.8	11.3	3.3	3.8	17.4	9.3	15.8	29.6	20.8	30.8	48.6	37.9	44.4	63.9	54.3
Northern Slope:															
Benton, Fort, Mont. ....	11.9	21.3	14.7	13.1	26.0	19.1	25.6	42.8	31.8	32.3	52.2	40.9	42.7	64.3	52.6
Cheyenne, Wyo. ....	20.1	32.1	22.7	19.3	33.3	23.2	25.5	42.3	30.5	31.3	49.5	38.6	40.5	59.3	48.0
North Platte, Nebr. ....	13.9	29.8	19.3	15.8	33.9	22.7	27.0	45.1	34.6	37.9	56.3	46.3	50.2	66.2	57.2
Middle Slope:															
Denver, Colo. ....	23.4	38.0	29.5	22.3	37.2	28.9	30.9	48.0	39.8	37.9	55.8	47.8	46.7	63.8	55.7
Pike's Peak, Colo. ....	0.5	4.6	1.3	0.7	6.5	3.0	3.7	11.4	6.4	8.9	17.7	12.3	17.7	26.6	21.0
Dodge City, Kans. ....	19.9	36.2	22.2	22.4	40.3	29.7	32.6	52.1	40.7	42.0	63.5	51.2	53.3	71.3	60.1
Elliott, Fort, Tex. ....	23.7	41.8	29.8	26.6	45.8	34.1	36.4	56.8	44.2	44.3	67.4	54.9	54.0	72.6	62.7
Southern Slope:															
Concho, Fort, Tex. ....	35.2	52.6	40.7	40.3	58.1	46.7	47.3	68.5	54.9	53.3	77.0	61.5	62.1	82.8	68.8
Stockton, Fort, Tex. ....	34.3	54.7	40.3	39.0	60.0	46.6	45.2	68.8	54.4	50.3	76.3	61.0	63.7	82.9	68.9
Southern Plateau:															
El Paso, Tex. ....	34.1	53.1	42.9	39.3	58.8	48.7	44.9	65.9	55.3	51.8	74.8	62.3	59.3	84.1	71.3
Apache, Fort, Ariz. ....	23.1	45.9	32.5	26.7	48.7	36.7	31.6	56.2	42.8	34.9	64.3	49.0	40.4	72.8	56.8
Grant, Fort, Ariz. ....	34.1	49.8	42.5	37.7	51.6	43.6	41.9	58.3	49.0	47.2	66.6	57.5	55.9	76.6	65.5
Prescott, Ariz. ....	25.4	45.1	33.0	26.4	45.9	35.6	32.2	52.7	42.7	37.7	60.0	49.7	43.5	59.3	58.3
Middle Plateau:															
Salt Lake City, Utah. ....	24.5	32.1	27.2	25.4	34.8	28.9	34.5	46.1	39.3	42.0	54.2	47.8	50.0	64.3	56.9
Northern Plateau:															
Lewiston, Idaho. ....	29.0	34.0	31.8	26.4	34.2	30.8	37.1	48.3	44.3	43.0	57.3	52.2	48.9	66.0	60.9
Dayton, Wash. ....	28.2	35.2	29.3	24.0	35.8	27.5	35.2	50.9	41.0	40.4	58.2	47.9	45.5	76.7	65.0
North Pacific Coast:															
Olympia, Wash. ....	35.9	39.5	38.0	33.9	39.4	37.4	38.1	47.1	44.7	41.6	52.7	49.7	44.1	59.0	56.0
Portland, Oreg. ....	37.3	41.3	39.4	34.8	40.9	38.3	40.7	50.2	47.0	45.0	56.4	52.0	48.4	62.8	58.5
Middle Pacific Coast:															
Sacramento, Cal. ....	40.7	48.8	46.3	42.4	51.7	49.1	47.4	58.5	54.4	50.5	62.2	57.6	55.5	70.1	64.7
San Francisco, Cal. ....	46.8	51.1	49.9	46.8	52.2	50.3	49.4	55.8	52.2	50.6	57.9	53.1	53.0	62.0	56.0
South Pacific Coast:															
Los Angeles, Cal. ....	44.9	60.4	50.6	46.1	61.6	51.7	47.8	63.0	53.4	50.6	66.7	55.6	53.9	72.3	59.4
San Diego, Cal. ....	47.0	60.0	51.4	48.1	59.9	52.6	50.4	60.6	54.2	53.2	63.3	56.9	57.1	66.6	60.4
Alaska Stations:															
Saint Michael's, Alaska. ....	3.5	6.3	6.2	0.3	1.8	3.3	8.1	11.1	13.1	16.0	20.4	22.9	28.8	34.6	36.2



(Washington time) at stations of the Signal Service, &amp;c.—Continued.

June.			July.			August.			September.			October.			November.			December.		
7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.
57.0	63.2	56.8	61.1	69.8	61.8	60.0	69.9	62.1	54.2	63.9	56.0	42.6	51.7	44.5	29.9	35.5	31.0	22.2	26.7	23.1
57.4	66.7	59.0	61.2	71.5	63.2	59.9	70.0	62.6	53.3	63.3	56.3	42.8	50.7	45.5	27.8	34.3	30.2	19.3	24.8	21.2
62.6	68.3	62.5	66.6	71.8	66.0	64.0	72.2	66.7	58.7	67.6	61.1	48.0	55.9	50.9	36.2	40.8	37.8	28.3	31.5	29.6
56.8	62.0	55.6	61.8	68.3	61.1	60.0	67.9	60.7	53.7	62.2	54.7	43.2	50.2	44.4	28.3	34.2	30.2	21.0	25.8	22.4
60.3	68.0	60.1	63.9	72.6	64.6	63.2	73.1	65.4	58.1	68.6	60.2	46.6	55.2	48.6	32.8	39.2	33.9	24.8	29.5	26.1
62.5	68.9	64.0	67.4	75.2	69.8	67.4	75.5	70.5	60.9	70.1	64.0	50.4	58.5	53.9	35.3	42.6	38.5	26.1	31.8	28.9
59.4	65.6	61.4	64.2	72.4	66.6	64.2	72.5	67.4	57.7	66.1	61.1	47.7	55.5	51.3	32.1	38.6	35.5	23.0	27.8	25.6
55.6	62.3	56.8	61.9	70.3	63.3	60.9	68.3	63.2	52.0	61.2	55.4	42.1	49.8	45.2	24.7	31.9	27.5	12.4	26.4	15.9
61.2	73.9	65.9	63.6	77.3	68.8	63.0	77.1	68.6	53.6	67.4	58.7	43.7	54.5	47.5	26.1	35.5	29.6	15.3	22.8	18.2
64.1	74.6	68.7	66.1	77.4	70.9	65.0	77.0	70.3	56.8	69.0	62.2	46.5	56.4	51.4	29.7	38.3	33.9	18.9	25.9	22.4
64.8	75.8	68.9	67.2	80.3	72.7	66.6	79.9	71.7	59.3	72.9	64.2	49.4	60.4	53.7	34.4	43.9	38.4	25.5	32.4	28.8
63.5	76.7	68.3	66.2	80.7	71.2	64.7	80.8	70.4	56.9	72.6	62.1	46.8	60.0	55.1	31.3	41.7	34.8	21.5	29.2	24.0
62.7	75.2	67.4	65.9	79.6	70.7	64.4	79.1	69.7	56.6	71.4	61.8	46.6	58.5	55.2	30.6	40.8	35.1	21.4	28.6	24.7
67.1	78.4	69.9	70.6	83.1	74.3	68.1	82.9	73.0	60.4	76.2	66.0	50.0	62.2	55.4	34.8	44.8	38.5	25.3	32.8	28.5
72.0	81.6	74.1	74.5	84.4	76.8	71.9	84.2	75.7	64.9	78.0	69.1	56.8	68.9	60.8	41.6	51.8	45.9	35.2	42.9	38.1
66.6	77.6	70.2	69.9	82.1	73.8	67.4	81.9	72.5	60.2	75.3	65.7	51.4	62.9	55.6	37.1	46.4	40.5	29.1	35.1	31.5
67.7	80.3	71.8	71.1	84.3	75.6	69.4	84.1	74.9	63.0	78.3	69.1	53.4	65.5	58.1	38.9	48.6	42.7	31.5	38.0	34.1
67.5	80.3	72.7	70.6	83.6	75.9	68.3	83.0	74.3	60.3	76.8	66.5	50.0	64.1	55.1	35.2	47.0	39.2	26.9	36.2	30.8
66.4	78.8	71.0	69.8	82.1	74.6	67.2	81.5	73.0	56.2	73.0	64.3	47.7	60.2	52.6	30.8	42.4	35.7	21.1	29.4	24.4
63.6	77.2	68.3	66.0	80.0	71.1	64.7	81.3	70.9	53.7	72.0	59.6	42.9	57.6	48.1	25.8	40.1	30.1	16.0	26.3	19.0
58.3	73.8	63.8	60.2	76.7	66.4	58.7	77.6	66.9	47.1	66.0	54.4	36.3	51.7	41.2	20.0	32.0	24.1	8.7	17.5	10.7
55.8	74.1	63.0	57.7	76.9	64.8	55.8	78.7	65.6	43.9	65.7	51.8	34.1	50.4	44.0	19.1	31.0	22.7	6.0	16.6	8.2
53.5	73.2	62.9	58.6	79.6	68.2	57.5	79.4	68.6	45.6	65.5	55.2	34.2	50.2	44.0	23.8	37.8	28.9	14.5	26.0	19.3
50.5	72.5	59.2	54.6	78.7	64.0	53.4	77.1	62.5	44.7	68.8	53.2	35.8	52.7	46.0	27.1	40.7	28.9	23.6	35.1	25.1
61.0	77.7	67.8	64.6	81.6	71.3	62.7	81.9	70.5	52.4	73.1	60.5	41.4	59.4	48.1	24.6	45.1	31.1	18.6	33.7	22.2
56.9	76.7	67.3	62.2	82.6	72.2	60.9	80.1	70.5	51.2	72.6	62.1	41.4	59.2	49.8	28.5	45.3	34.4	26.9	39.6	30.5
29.6	38.8	32.5	35.8	45.3	38.1	34.3	43.2	36.8	26.5	36.3	29.4	17.4	24.7	19.2	7.4	12.6	8.8	6.0	9.5	6.1
64.6	83.5	71.7	67.9	86.0	74.6	65.5	84.0	72.4	57.8	78.3	64.9	46.8	64.6	55.4	29.0	44.8	35.4	22.9	38.6	27.8
63.7	83.0	72.9	66.5	85.5	75.9	64.8	84.0	73.2	58.6	79.0	66.2	49.2	64.6	55.6	32.8	52.0	38.2	26.6	43.5	31.2
70.5	92.0	77.3	72.7	93.0	79.4	70.1	90.2	77.0	64.3	83.1	71.3	57.4	74.6	62.3	43.2	59.7	47.9	37.9	55.1	42.9
68.4	91.3	77.7	70.3	90.5	79.3	67.4	87.3	75.7	62.0	81.3	69.2	54.4	73.9	61.4	41.3	60.0	47.1	37.3	57.0	42.7
68.7	93.8	79.9	71.7	93.2	80.4	68.9	88.5	76.6	61.2	82.6	69.9	51.3	74.4	60.5	38.8	60.4	48.0	35.8	55.4	43.9
49.0	84.7	67.4	59.3	85.2	71.2	58.3	80.9	67.9	48.0	77.6	60.6	39.7	67.9	50.6	31.0	66.6	37.7	26.3	49.3	34.6
66.5	85.8	76.1	69.2	85.5	77.1	66.4	81.0	72.9	62.1	78.1	69.7	52.8	69.2	60.0	41.4	59.0	48.8	36.8	53.5	44.6
51.1	80.1	68.0	60.1	82.3	71.8	59.5	79.2	68.7	49.7	75.3	61.3	40.1	64.7	50.3	28.6	54.6	38.6	29.1	48.8	35.9
69.6	77.9	68.1	65.7	83.3	74.3	66.0	82.8	73.7	55.6	71.8	62.3	44.1	56.6	48.0	31.3	42.2	34.7	31.1	38.4	33.4
56.7	74.0	69.9	61.6	79.7	76.9	60.0	79.1	76.9	51.1	66.5	61.5	43.0	54.4	49.5	34.2	44.2	38.0	29.4	34.3	31.6
52.0	74.2	62.8	55.0	80.0	67.1	54.4	80.5	65.3	48.3	70.1	56.1	41.0	56.8	46.6	33.5	43.0	35.9	27.8	34.5	29.5
49.4	64.0	61.9	51.4	66.9	65.1	53.6	66.6	64.2	49.2	60.8	56.6	45.4	52.6	48.6	41.2	46.0	43.0	37.4	41.4	39.9
54.1	67.3	63.7	56.3	70.3	67.8	56.0	70.1	66.5	52.2	64.8	59.8	46.8	55.0	51.0	41.4	47.9	44.3	38.2	42.5	40.3
58.5	76.3	68.8	61.3	81.4	73.1	60.2	80.3	71.8	58.8	76.7	68.8	51.4	66.1	59.7	44.1	57.2	52.2	43.6	50.8	48.1
54.3	62.5	56.8	55.1	63.7	57.4	54.8	62.8	56.7	55.3	64.4	57.8	53.9	61.5	56.8	51.0	57.0	54.4	49.5	53.3	52.1
87.5	76.7	62.4	59.7	80.8	64.0	60.5	82.3	65.9	58.3	80.1	64.1	53.5	72.5	59.5	49.1	69.0	55.5	48.2	63.7	53.3
60.5	69.7	63.2	63.1	72.1	65.4	64.7	73.8	67.1	61.7	72.0	65.1	56.8	67.8	60.1	51.4	65.6	55.3	50.9	62.7	54.2
42.1	47.3	49.1	50.6	54.6	55.9	50.1	53.1	54.3	41.3	45.3	45.1	28.2	31.5	31.0	14.8	17.5	16.7	3.5	6.1	5.6

## APPENDIX 24.

*Mean a. m., p. m., and midnight temperatures, in degrees Fahrenheit, at stations of the commencement of observations*

[Observations prior to August 25, 1872, were taken at 7.35 a. m., 4.35 and 11.35 p. m. (Washington time); November 1, 1879, to December 31, 1884, at

Stations.	January.			February.			March.			April.			May.		
	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.
<b>New England:</b>															
Eastport, Me. ....	17.0	22.4	19.2	20.1	25.9	22.0	28.0	31.6	28.0	36.1	41.5	36.0	46.4	51.5	44.1
Portland, Me. ....	19.8	27.8	22.5	22.3	30.8	25.7	29.4	37.3	31.5	40.6	48.3	41.2	52.6	59.8	52.9
Mt. Wash'ton, N. H. .	4.5	6.2	5.2	6.2	7.8	6.2	9.4	12.0	10.1	11.9	22.2	20.0	31.6	36.0	32.7
Boston, Mass. ....	23.2	30.2	25.3	24.9	32.9	27.1	31.5	38.4	32.2	41.7	48.5	41.5	55.5	62.1	52.7
Block Island, R. I. .	28.1	32.2	30.0	31.4	35.7	32.8	33.7	38.8	35.1	40.7	46.4	41.3	50.6	55.0	50.0
New Haven, Conn. .	24.1	31.6	26.9	26.4	34.2	29.0	32.5	40.0	33.7	43.4	50.5	43.0	56.3	63.5	54.5
New London, Conn. .	25.4	31.9	28.0	27.0	33.6	29.0	33.3	39.0	34.0	43.9	48.9	42.5	56.2	60.1	53.0
<b>Middle Atlantic States:</b>															
Albany, N. Y. ....	20.2	26.6	22.7	22.6	29.9	25.1	29.8	36.8	31.8	42.2	50.5	42.9	56.2	63.5	56.9
New York City. ....	27.1	33.1	29.3	28.6	35.4	30.9	33.7	41.1	35.8	43.8	52.0	45.2	55.9	64.4	56.9
Philadelphia, Pa. .	28.8	34.8	30.8	30.7	38.5	33.3	35.8	44.5	38.7	45.7	55.9	47.7	57.8	69.2	59.8
Atlantic City, N. J. .	29.3	35.2	31.2	31.5	37.6	33.1	36.1	42.3	37.2	44.7	54.9	44.4	56.3	60.8	54.9
Barnegat City, N. J. .	29.1	34.2	30.4	31.0	36.5	32.0	36.0	41.4	36.6	44.8	54.8	43.5	57.3	59.7	54.3
Cape May, N. J. ....	31.8	36.3	33.9	33.4	39.0	35.5	37.9	42.9	39.3	45.5	55.1	44.7	56.8	62.3	57.2
Sandy Hook, N. J. .	28.5	33.1	30.2	29.9	35.7	31.4	34.8	40.9	36.5	43.6	50.0	43.4	56.8	60.3	56.4
Del. B'kwater, Del. .	33.2	37.0	34.4	36.0	42.1	37.3	37.8	43.5	39.8	45.8	55.1	47.1	57.6	63.8	58.1
Baltimore, Md. ....	31.3	37.9	34.0	33.7	42.1	36.8	38.4	42.7	0.41	44.8	53.8	45.1	56.0	61.7	56.2
Washington City. .	29.4	37.5	32.0	32.1	42.3	34.9	37.2	43.8	40.6	47.7	55.9	48.0	59.8	67.2	61.2
Cape Henry, Va. ....	38.4	42.8	40.0	41.0	46.2	42.2	44.8	50.1	46.1	52.3	60.7	52.1	62.6	68.0	61.9
Chincoteague, Va. .	31.5	35.9	33.0	36.8	42.7	38.1	38.9	45.5	42.0	48.6	56.2	44.7	58.6	63.8	58.2
Lynchburg, Va. ....	32.8	42.5	35.6	35.8	47.6	39.3	39.5	53.2	44.4	53.0	63.3	53.7	62.3	74.1	63.2
Norfolk, Va. ....	38.7	44.0	39.4	39.8	48.3	42.1	44.4	53.3	46.8	53.1	61.9	53.6	64.4	72.8	64.6
<b>South Atlantic States:</b>															
Charlotte, N. C. ....	37.0	46.5	40.8	41.3	53.4	46.3	45.3	58.2	49.8	55.3	66.1	57.0	64.0	76.3	66.6
Hatteras, N. C. ....	42.3	44.7	42.6	47.0	51.5	47.7	47.6	53.2	49.2	53.8	58.8	53.5	64.4	70.2	63.6
Kitty Hawk, N. C. .	39.9	44.3	41.1	42.1	47.0	43.7	45.6	52.0	48.6	52.7	57.9	52.4	62.0	68.0	61.2
Macon, Fort, N. C. .	41.5	47.8	42.7	46.3	54.6	48.4	47.9	55.5	53.0	58.4	62.1	55.3	65.5	73.1	65.5
Smithville, N. C. ....	43.5	51.0	46.2	46.1	55.0	49.4	50.4	59.2	53.3	57.7	65.5	53.9	66.6	74.7	67.4
Wilmington, N. C. .	42.5	52.6	45.4	45.1	56.2	48.5	50.3	60.7	53.3	57.9	66.7	53.0	66.6	73.5	66.5
Charleston, S. C. ....	45.5	53.6	48.9	48.9	58.0	52.3	53.6	63.3	57.0	60.8	69.4	63.0	70.7	77.1	71.0
Augusta, Ga. ....	41.7	54.6	46.1	44.6	59.4	49.6	49.2	65.4	54.4	57.7	67.2	46.1	56.7	68.1	60.4
Savannah, Ga. ....	46.6	57.6	50.8	49.4	60.8	53.8	54.6	66.0	58.3	62.8	72.3	60.4	71.2	78.7	71.0
Jacksonville, Fla. .	50.4	62.4	53.8	53.1	65.5	56.8	57.8	70.2	60.8	65.4	75.6	65.8	73.7	80.8	71.8
<b>Florida Peninsula:</b>															
Cedar Key, Fla. ....	54.5	62.4	57.6	58.5	66.9	61.6	60.4	68.9	64.1	67.0	75.3	69.9	77.2	88.1	77.4
Key West, Fla. ....	67.7	73.5	69.3	69.5	75.5	70.8	71.3	77.7	67.2	72.5	80.6	75.0	83.5	93.5	83.5
Sanford, Fla. ....	50.0	60.8	62.1	59.9	73.9	69.5	63.0	73.8	65.2	66.2	79.0	67.0	72.4	83.4	70.6
<b>Eastern Gulf States:</b>															
Atlanta, Ga. ....	39.6	48.6	44.0	43.5	54.4	48.9	47.5	60.2	53.4	54.8	67.2	60.2	63.6	76.0	68.2
Pensacola, Fla. ....	50.1	58.6	53.5	53.7	63.6	59.8	57.0	67.4	61.0	61.4	71.3	60.6	71.0	79.4	72.1
Mobile, Ala. ....	45.8	53.3	49.7	49.8	61.5	54.0	54.7	66.6	59.0	62.0	73.9	65.5	69.0	81.7	72.0
Montgomery, Ala. .	43.6	54.8	48.3	46.8	60.1	52.3	51.0	65.8	57.0	58.3	72.5	63.0	67.5	81.4	71.1
Vicksburg, Miss. ....	42.8	53.2	47.6	46.7	59.6	52.8	52.6	66.6	58.3	59.0	71.3	62.4	67.5	80.1	71.4
New Orleans, La. .	50.0	59.0	53.4	54.1	64.0	57.4	58.7	68.8	62.3	65.6	74.7	68.1	72.8	86.0	73.4
<b>Western Gulf States:</b>															
Shreveport, La. ....	40.6	51.8	45.4	45.3	58.1	51.4	51.8	66.5	58.4	58.8	73.5	64.4	67.6	81.3	71.6
Fort Smith, Ark. ....	26.6	38.0	31.0	35.6	46.0	41.0	42.9	59.0	50.2	51.1	67.8	58.6	69.2	77.4	66.0
Little Rock, Ark. .	38.7	47.5	42.2	43.4	52.6	48.1	48.2	59.8	50.4	52.6	66.0	60.6	62.8	74.4	66.0
Galveston, Tex. ....	49.9	55.4	52.7	54.5	60.6	57.0	61.1	67.2	63.3	66.3	73.3	68.6	73.4	80.6	75.2
Indianola, Tex. ....	49.2	56.9	52.3	54.8	62.1	56.4	61.7	69.4	64.4	66.6	74.6	68.6	73.3	80.8	74.7
Palestine, Tex. ....	36.2	47.6	42.3	40.1	55.6	50.4	53.7	67.3	61.3	65.8	71.9	65.0	66.4	77.6	69.6
<b>Rio Grande Valley:</b>															
Brownsville, Tex. .	52.6	65.8	57.0	57.9	69.4	60.6	64.2	75.6	67.4	69.8	80.9	72.4	75.4	85.2	77.1
Rio Grande City, Tex. .	50.9	65.2	57.4	56.8	72.6	62.3	62.8	80.9	68.7	67.7	78.2	73.4	73.3	91.9	78.1
<b>Ohio Valley and Tennessee:</b>															
Chattanooga, Tenn. .	38.0	46.8	42.3	41.5	52.1	46.2	45.9	58.3	51.1	53.7	67.1	58.2	62.5	75.9	66.3
Knoxville, Tenn. .	33.0	43.0	36.5	37.0	48.8	41.7	41.0	55.3	47.3	50.5	65.5	55.7	60.1	75.5	64.0
Memphis, Tenn. ....	35.5	44.4	40.0	39.8	50.2	45.3	44.6	57.6	50.5	53.7	67.2	58.0	62.8	77.2	69.0
Nashville, Tenn. ....	34.6	43.7	38.4	38.5	49.3	43.1	44.0	54.2	49.0	51.4	66.7	58.1	61.7	77.1	67.2
Louisville, Ky. ....	31.2	38.4	34.3	34.9	43.1	39.1	39.5	54.8	44.4	45.0	61.6	54.4	61.8	77.9	65.4

## APPENDIX 24.

*Signal Service, United States Army, for each month of the year. (Compiled from the com-  
to December 31, 1884.)*

from August 25, 1872, to November 1, 1879, at 7.35 a. m., 4.35 and 11 p. m. (Washington time); and from  
7 a. m., 3 and 11 p. m. (Washington time).]

June.			July.			August.			September.			October.			November.			December.		
a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.
54.7	58.9	51.2	58.6	65.1	56.4	58.7	65.5	57.2	54.5	58.4	53.3	48.7	49.8	45.5	34.2	37.5	34.6	23.5	27.1	24.6
62.0	70.0	60.7	67.4	75.1	66.1	65.2	73.7	66.1	57.9	66.1	58.8	47.5	55.0	48.9	35.7	41.5	37.1	25.5	31.2	27.3
42.4	46.7	42.5	44.0	50.3	46.3	45.6	50.1	46.2	39.5	42.8	39.7	29.4	31.7	29.6	15.8	17.2	16.2	8.5	9.5	9.4
64.9	71.6	62.1	70.0	76.4	67.7	67.5	74.6	66.2	60.0	67.7	59.5	49.3	57.0	49.8	36.6	43.1	37.6	27.1	33.3	29.0
61.3	65.8	60.1	66.8	72.2	66.5	66.4	72.0	66.9	63.0	67.7	63.3	53.2	56.2	54.3	42.9	47.0	44.7	34.7	37.6	36.0
66.2	73.2	63.9	70.9	77.6	69.4	68.0	75.8	67.4	61.2	69.6	61.5	50.1	56.1	51.5	37.6	45.1	39.6	28.2	34.6	30.6
65.3	69.5	62.4	70.8	75.0	68.0	69.0	73.9	67.1	61.7	67.7	60.9	51.4	57.8	51.8	38.5	44.6	39.8	29.5	34.9	31.3
66.3	74.5	65.0	69.8	78.2	69.1	67.3	77.6	67.7	59.6	69.8	60.8	47.5	56.9	49.4	36.3	44.3	38.0	26.3	30.9	28.4
65.7	74.0	66.2	70.9	78.4	71.1	69.3	77.1	67.0	62.0	70.7	63.7	52.8	60.4	54.2	39.7	46.0	41.0	30.7	36.0	32.5
67.8	76.8	68.4	72.5	82.2	73.8	70.4	79.6	70.1	62.8	72.9	64.8	52.2	62.6	54.2	39.9	47.7	42.1	31.7	37.6	33.9
66.1	70.4	64.0	71.2	76.2	69.4	70.5	75.6	67.0	65.3	71.0	65.5	54.8	61.1	55.5	41.7	48.8	43.1	33.4	38.6	35.0
67.1	69.5	63.2	72.6	75.0	68.9	71.4	74.2	69.2	67.5	76.9	64.7	54.8	58.9	54.6	41.9	47.3	42.6	33.0	38.6	34.3
66.7	71.7	66.5	71.9	77.1	71.6	67.1	76.7	67.5	66.0	71.6	66.9	56.7	62.2	58.0	44.3	49.1	45.7	35.6	39.7	37.5
66.3	73.7	66.0	71.8	77.9	71.6	67.0	76.7	67.8	64.5	71.5	65.5	54.6	60.8	55.6	42.4	47.7	44.4	32.9	37.4	34.6
65.4	71.8	66.3	70.9	76.9	71.3	67.0	76.6	67.3	67.4	74.0	68.4	58.2	64.7	59.4	45.0	51.2	48.3	36.0	41.3	37.2
70.6	80.4	70.9	75.0	84.7	75.2	71.4	81.4	73.1	63.9	74.4	66.1	53.5	64.0	56.2	42.2	49.6	44.2	33.9	40.6	36.6
69.9	80.7	70.7	74.0	85.0	74.5	70.7	81.8	71.8	63.2	75.5	64.9	52.0	65.0	54.7	39.7	45.0	42.3	32.0	40.2	34.8
72.0	77.7	70.4	76.5	82.3	74.8	74.7	79.7	73.9	70.4	76.0	69.8	61.2	66.8	61.5	49.6	55.0	50.7	41.1	46.6	43.0
68.4	73.2	67.0	73.0	78.1	72.1	72.8	75.1	71.7	68.7	73.8	68.1	59.3	64.5	60.1	45.1	51.6	47.0	36.4	42.3	38.1
71.4	80.9	71.1	75.8	85.2	75.4	71.8	82.5	72.9	64.2	76.4	65.9	52.8	66.8	55.8	40.9	46.2	43.4	34.6	44.2	37.4
73.8	81.4	71.4	78.0	85.1	75.4	75.3	81.9	73.9	68.3	76.2	68.4	57.9	66.6	59.4	46.7	54.2	48.6	39.3	46.4	41.7
72.0	82.2	73.4	75.1	85.8	77.0	71.7	82.0	74.9	64.8	77.0	68.3	55.9	69.6	60.5	48.9	56.6	49.5	38.0	48.9	42.3
73.0	78.2	71.6	77.0	82.0	75.7	76.1	80.7	75.3	73.8	78.7	73.4	66.1	70.5	66.1	54.3	58.7	55.5	45.7	49.6	46.8
71.2	77.7	70.5	76.9	82.1	75.7	75.3	80.2	74.7	70.7	76.6	71.0	62.2	67.2	62.5	50.9	56.3	52.1	42.8	47.9	44.5
73.1	79.0	73.1	77.7	82.5	76.9	75.6	81.5	77.0	72.8	78.6	73.6	64.7	71.8	66.1	52.2	58.0	54.1	45.2	52.8	47.3
74.6	81.2	74.7	78.6	85.5	78.9	76.4	83.7	77.8	71.4	79.1	73.2	62.6	70.9	64.8	50.5	56.0	52.7	44.0	52.5	47.3
74.6	81.9	73.8	78.1	85.8	74.7	75.7	83.4	76.2	69.8	79.1	71.3	59.7	70.7	62.2	49.5	56.1	52.6	42.8	50.4	46.5
77.2	84.1	77.3	80.6	87.2	80.6	78.0	84.8	79.3	72.8	80.5	75.0	63.5	72.0	66.1	53.5	59.2	56.4	47.1	55.8	50.4
74.4	82.2	75.9	77.9	89.2	79.1	75.0	86.7	77.1	69.9	82.8	72.3	58.2	74.0	61.8	47.7	53.2	51.8	41.9	55.7	46.2
78.4	84.7	77.1	81.4	87.3	79.9	78.4	85.1	78.2	72.7	79.0	74.1	62.6	72.9	65.7	52.8	58.3	56.7	47.1	58.5	51.4
79.4	85.0	77.0	81.2	87.3	79.2	79.4	85.8	77.7	75.0	82.7	75.8	66.6	75.9	68.3	57.1	63.0	60.0	50.7	62.8	54.5
78.3	84.9	78.8	80.7	86.5	80.9	78.8	86.6	79.7	75.4	85.1	78.3	70.1	79.4	72.8	60.1	66.0	63.1	56.0	64.2	59.0
82.0	86.6	81.0	83.8	87.4	82.0	82.6	87.8	82.3	81.3	86.0	81.2	77.3	81.7	77.8	73.8	79.5	73.8	68.5	73.8	69.8
77.8	83.6	74.5	79.8	89.4	79.2	77.4	87.0	77.7	75.0	83.0	75.7	71.7	80.4	72.4	63.3	73.4	64.6	58.8	71.8	61.4
70.9	81.3	73.8	74.0	85.0	77.3	70.4	81.8	74.1	65.5	78.4	70.8	58.3	70.8	63.1	46.0	55.8	50.3	40.4	50.6	44.9
77.1	84.2	77.9	78.2	85.6	79.3	76.5	86.4	78.9	72.7	83.1	76.0	67.1	77.8	70.6	54.5	63.6	58.1	51.1	60.5	54.4
76.8	87.0	80.8	78.4	85.0	80.0	76.5	86.6	78.1	71.0	83.5	75.2	62.5	75.7	66.6	52.6	64.7	56.6	47.4	57.7	51.2
74.8	86.3	77.0	77.5	89.6	79.9	75.1	87.2	78.1	68.9	83.6	73.9	58.1	74.8	64.5	48.6	56.2	53.6	43.9	55.6	48.1
75.3	87.1	77.7	77.7	89.2	79.4	75.0	86.5	77.8	68.5	83.5	73.2	58.4	74.5	64.0	49.1	56.2	53.6	44.0	56.3	49.6
78.8	84.9	79.9	79.6	86.6	81.2	78.8	86.0	80.6	75.4	82.7	77.1	67.1	75.7	68.5	57.2	63.7	60.0	52.2	60.4	55.0
74.9	85.8	78.3	77.6	91.1	80.8	76.1	90.1	79.7	68.6	83.5	72.9	59.1	75.1	65.0	47.8	56.9	53.2	43.1	55.3	47.8
69.7	85.7	74.9	72.7	88.0	77.5	69.1	86.2	74.9	63.8	83.3	70.5	57.9	73.5	62.2	44.6	55.9	49.4	34.7	47.3	39.0
72.0	84.9	76.8	74.7	87.5	79.4	71.8	85.5	76.8	65.5	80.2	71.1	59.7	72.3	64.3	46.0	57.6	50.8	40.5	50.3	45.0
79.9	86.7	80.8	81.7	88.9	83.0	80.0	87.7	82.5	76.8	83.0	79.1	69.8	76.1	72.3	58.1	64.8	61.8	53.9	59.0	56.3
72.6	85.2	79.9	91.0	89.4	81.5	79.8	87.3	81.1	76.2	83.1	78.5	69.4	77.3	72.3	58.6	66.2	61.4	52.9	60.0	55.3
72.6	86.0	77.7	75.5	91.4	80.1	72.2	88.3	78.5	63.3	84.2	74.9	62.4	76.1	67.6	51.1	63.4	55.8	44.3	55.5	49.3
79.2	88.9	81.1	80.6	90.1	82.2	78.7	89.5	81.1	74.9	86.0	78.0	71.1	81.7	74.0	60.7	71.4	64.1	56.0	66.3	58.9
74.5	92.8	87.9	07.8	97.5	83.9	77.1	94.0	80.8	73.2	91.3	79.3	67.0	84.1	72.4	57.9	72.5	62.6	52.4	67.3	58.4
70.1	82.6	72.8	73.0	86.0	75.6	70.1	82.9	73.4	64.0	78.9	68.5	57.8	71.5	62.1	43.9	56.4	48.4	39.2	48.8	42.6
68.2	81.1	70.7	71.6	84.0	74.0	68.9	83.2	72.0	61.7	78.0	65.8	50.8	68.5	56.1	40.2	53.2	44.5	34.2	44.9	38.1
73.9	84.0	75.4	76.8	87.0	78.4	74.3	86.4	77.0	65.5	79.0	69.7	56.0	69.4	60.5	44.3	55.3	48.6	37.9	47.0	42.1
73.3	83.7	74.1	76.1	86.8	77.1	73.1	85.6	75.8	64.7	78.6	68.6	54.4	69.1	58.9	42.3	54.2	46.9	36.0	45.7	40.4
70.7	81.0	72.7	74.4	85.1	77.0	70.8	83.5	74.7	62.8	76.1	67.6	52.6	65.8	57.4	40.9	50.0	44.4	34.7	41.2	37.3

*Mean a. m., p. m., and midnight temperatures, in degrees Fahrenheit, at stations*

Stations.	January.			February.			March.			April.			May.		
	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.
Ohio Valley and Tennessee—Continued:															
Indianapolis, Ind.	25.6	33.5	29.0	26.7	38.6	33.9	35.3	45.9	39.8	47.2	59.0	51.2	59.4	71.0	62.0
Cincinnati, Ohio	30.6	37.9	33.4	33.7	42.8	37.8	38.9	49.0	43.2	49.1	60.8	53.7	60.0	72.7	64.2
Columbus, Ohio	25.0	32.2	28.8	31.1	38.2	34.8	35.5	44.2	39.7	44.6	56.4	49.4	57.8	70.5	61.7
Pittsburg, Pa.	28.1	34.8	31.1	29.5	38.0	32.5	33.9	43.9	37.7	44.3	57.6	48.0	55.9	70.7	59.4
Lower Lakes:															
Buffalo, N. Y.	23.2	26.4	24.2	23.0	28.0	25.2	28.6	33.1	30.0	38.9	44.8	40.0	51.4	45.7	45.2
Oswego, N. Y.	24.1	29.8	25.5	24.2	29.4	26.2	29.6	34.4	31.8	40.0	45.7	41.8	53.1	48.9	45.3
Rochester, N. Y.	22.5	26.0	23.5	22.8	28.3	24.6	28.1	33.4	29.7	40.0	47.3	34.1	53.5	56.2	54.1
Erie, Pa.	25.5	29.7	27.3	26.3	31.5	28.9	31.0	36.4	33.3	41.5	47.1	42.4	55.2	61.7	75.5
Cleveland, Ohio	24.2	28.9	25.8	25.6	31.6	28.5	31.0	37.7	34.3	42.4	48.6	44.1	54.9	62.2	45.7
Sandusky, Ohio	25.5	30.3	27.6	29.0	34.9	31.9	34.2	39.3	36.6	44.3	50.6	46.9	57.0	64.7	75.9
Toledo, Ohio	24.4	30.6	26.6	26.2	33.7	29.7	32.4	37.4	34.3	42.5	48.6	44.1	54.9	62.2	45.7
Detroit, Mich.	22.2	27.5	23.9	24.1	31.3	26.5	29.4	37.5	33.2	40.8	45.1	42.3	53.3	56.4	75.3
Upper Lakes:															
Alpena, Mich.	15.3	22.0	17.3	14.4	23.9	18.0	20.1	29.2	23.4	33.6	40.8	34.1	46.9	53.1	46.7
Escanaba, Mich.	10.9	18.8	14.0	11.5	22.0	15.7	16.8	28.1	21.4	31.8	38.1	34.0	46.3	54.8	47.2
Grand Haven, Mich.	23.4	27.3	24.8	22.9	29.9	26.0	27.9	34.9	31.0	40.4	46.7	42.4	53.6	59.2	53.5
Mackinaw City, Mich.	12.3	17.8	14.2	9.8	18.6	13.9	14.3	26.8	19.6	28.3	34.1	30.5	43.4	51.2	44.0
Marquette, Mich.	14.8	20.7	16.4	14.2	23.0	17.6	19.9	29.5	23.1	33.8	41.1	39.3	50.7	58.5	47.8
Port Huron, Mich.	18.8	25.0	20.9	20.9	28.0	23.7	26.3	33.0	29.0	38.5	44.7	40.9	52.0	63.8	50.0
Chicago, Ill.	21.6	28.2	24.3	25.1	32.6	28.9	31.3	37.8	34.8	42.2	48.7	45.0	55.4	60.4	45.6
Milwaukee, Wis.	17.3	23.8	20.1	20.6	28.2	24.7	27.3	34.0	30.4	39.7	45.9	42.1	53.1	58.8	52.4
Duluth, Minn.	6.6	16.4	11.2	11.4	22.3	17.1	18.4	30.6	24.5	33.8	43.1	37.4	45.3	53.8	47.4
Upper Mississippi Valley:															
Saint Paul, Minn.	8.4	17.3	12.1	12.4	24.4	17.5	22.5	33.4	27.8	38.0	51.8	43.9	53.0	66.1	57.3
La Crosse, Wis.	11.9	20.7	16.0	16.6	28.0	22.8	25.8	36.8	32.2	40.6	52.8	46.8	55.4	67.0	60.0
Davenport, Iowa	17.6	26.0	21.5	22.4	32.0	27.7	30.2	40.5	35.1	43.2	55.6	48.4	56.0	66.0	60.5
Des Moines, Iowa	15.1	25.1	20.1	20.2	31.4	25.5	29.3	41.4	34.8	44.1	55.7	48.8	55.4	69.0	100.1
Dubuque, Iowa	13.8	24.4	19.4	18.8	31.1	25.1	27.5	39.4	33.1	41.4	53.2	47.0	55.0	68.8	65.0
Keokuk, Iowa	20.3	29.5	24.5	25.5	36.0	30.3	32.6	43.9	37.3	45.5	55.8	50.3	58.2	70.1	162.0
Calro, Ill.	81.4	30.8	35.2	38.2	45.6	40.6	42.6	53.2	47.2	55.2	66.4	57.7	63.1	74.5	66.4
Springfield, Ill.	25.1	31.2	27.0	30.2	38.2	33.7	35.3	45.1	39.6	47.1	55.2	52.5	57.9	69.0	83.6
Saint Louis, Mo.	27.4	35.7	30.7	31.3	41.1	36.0	37.3	49.1	42.9	48.8	61.9	54.3	60.5	72.8	84.7
Missouri Valley:															
Leavenworth, Kans.	21.2	31.2	25.9	26.1	39.1	32.5	34.0	44.8	40.4	46.1	61.2	52.6	65.8	72.2	86.1
Omaha, Nebr.	15.8	26.0	20.6	21.0	33.2	26.9	29.2	42.6	35.1	42.8	55.6	49.0	56.0	69.0	63.9
Bennett, Fort, Dak.	3.3	17.3	10.6	9.0	23.2	16.4	21.4	35.5	27.8	34.9	51.6	42.4	44.8	60.5	65.8
Huron, Dak.	4.5	15.9	9.1	8.4	21.5	13.3	22.5	33.3	27.7	34.0	50.1	43.0	45.7	60.7	75.1
Yankton, Dak.	9.4	22.5	14.2	13.6	27.5	19.6	23.4	37.1	28.9	37.5	53.9	43.6	52.9	67.5	57.6
Extreme Northwest:															
Moorhead, Minn.	-8.4	3.2	-2.8	-0.3	11.4	5.8	9.7	23.2	17.5	31.4	44.4	37.7	54.5	59.3	52.6
St. Vincent, Minn.	-10.8	-1.8	-7.8	-5.1	6.6	0.5	5.7	18.4	13.7	27.1	40.4	33.0	44.1	59.7	75.0
Bismarck, Dak.	-0.3	12.2	5.0	5.7	18.2	10.2	15.5	28.7	20.8	33.0	48.0	38.8	44.8	63.5	53.3
Buford, Fort, Dak.	2.0	13.5	5.2	3.1	16.5	8.2	15.6	29.9	21.2	32.0	50.2	39.0	45.2	63.7	54.1
Northern Slope:															
Assinaboine, Fort. Mont.	8.0	13.6	9.8	9.3	16.8	14.1	23.0	34.4	28.3	32.9	50.2	41.2	43.6	61.0	52.8
Benton, Fort. Mont.	11.9	21.3	14.7	13.1	26.0	19.1	25.6	42.8	31.8	32.3	52.2	40.9	44.2	74.4	35.2
Custer, Fort. Mont.	12.0	23.6	16.6	14.4	26.8	20.1	23.9	39.8	31.3	33.8	53.7	44.4	54.4	64.1	154.8
Helena, Mont.	11.7	17.9	15.4	15.7	23.6	19.9	28.2	38.7	33.4	35.3	47.8	41.1	44.1	58.6	51.9
Maginnis, Fort. Mont.	14.2	20.4	17.6	9.4	18.4	12.8	24.4	35.9	26.2	31.7	45.6	35.3	42.4	56.4	44.0
Poplar River, Mont.	-5.3	9.3	2.6	-11.2	1.7	-4.1	20.5	33.6	26.9	30.5	47.9	37.7	44.5	63.2	51.9
Shaw, Fort. Mont.	14.2	21.1	16.6	15.7	24.8	18.6	24.8	41.1	32.0	38.0	50.4	41.3	49.0	60.9	50.0
Deadwood, Dak.	17.6	29.2	20.1	19.0	30.6	22.4	25.4	39.3	30.4	32.8	46.2	38.4	43.3	53.5	47.9
Cheyenne, Wyo.	20.0	32.5	22.5	21.8	36.6	25.3	32.5	44.2	39.0	39.1	49.6	37.7	42.3	61.3	48.9
North Platte, Nebr.	12.7	30.0	18.7	18.0	36.6	24.7	27.0	45.4	34.4	38.3	57.5	45.3	51.0	67.2	57.1
Middle Slope:															
Denver, Colo.	20.7	36.0	25.9	24.5	40.9	30.5	30.8	49.2	39.2	36.6	53.4	46.1	47.0	66.1	56.3
Pike's Peak, Colo.	0.6	5.4	2.1	1.0	6.9	2.9	4.4	11.2	6.5	8.6	17.4	11.6	18.3	28.7	20.8
West Las Animas, Colo.	10.8	35.2	19.6	15.0	39.9	25.7	28.0	45.4	15.0	6.6	36.1	40.8	47.4	68.8	55.5
Dodge City, Kans.	19.3	35.1	25.5	24.6	43.3	32.0	32.0	53.0	40.8	42.9	64.2	51.1	54.9	73.0	61.1
Elliot, Fort, Tex.	23.7	41.8	29.8	26.6	45.8	34.1	36.4	56.8	44.2	44.3	67.4	54.9	54.0	72.6	68.7
Southern Slope:															
Sill, Fort, Ind. T.	30.3	44.0	35.7	35.3	50.9	41.8	43.7	62.7	51.6	52.8	72.7	61.2	62.7	78.5	68.1
Concho, Fort, Tex.	34.9	53.4	40.8	39.4	59.1	46.5	47.7	87.0	73.6	53.8	77.4	62.3	63.6	64.4	270.2
Davis, Fort, Tex.	33.6	54.8	41.8	38.0	60.3	46.9	43.2	67.7	53.8	49.8	77.2	59.8	58.9	79.0	80.9
Stockton, Fort, Tex.	34.4	55.5	40.9	38.8	61.0	47.0	43.5	77.0	63.5	51.7	77.6	62.2	64.1	84.4	70.8
Southern Plateau:															
El Paso, Fort.	36.7	53.7	44.7	41.4	60.4	49.6	45.8	68.6	56.4	51.4	77.5	63.2	64.5	65.2	272.0
Apache, Fort, Ariz.	23.0	46.0	32.8	27.0	50.3	37.4	32.4	55.8	43.5	35.0	66.6	49.0	54.0	70.8	85.0



of the Signal Service, United States Army, for each month of the year, &c.—Continued.

June.			July.			August.			September.			October.			November.			December.		
a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.
68.8	79.1	70.2	72.4	83.0	74.0	68.7	81.8	71.9	59.8	73.8	64.0	49.7	62.4	54.3	36.5	45.6	40.2	29.2	36.1	32.3
69.5	80.7	72.5	73.3	84.8	76.6	70.3	82.5	75.3	62.5	75.3	67.0	52.4	64.4	56.7	40.5	49.3	43.5	33.5	40.7	36.3
66.2	77.4	69.3	70.4	82.2	73.7	66.5	80.0	68.4	60.1	74.1	64.5	51.2	63.4	55.3	37.0	46.6	40.8	29.7	35.1	31.8
65.4	78.9	68.1	68.5	82.3	70.8	65.3	81.1	69.2	58.4	73.9	62.4	49.0	62.6	52.0	37.3	45.4	39.2	30.7	36.5	32.5
62.6	68.5	63.0	67.3	73.4	68.2	66.2	74.2	67.5	59.2	66.9	60.4	48.3	54.7	49.7	35.7	39.8	36.7	27.7	30.5	28.9
62.1	69.2	62.3	67.5	74.5	68.0	66.7	74.4	68.0	59.3	67.3	60.8	48.8	55.2	50.3	37.2	40.5	38.2	28.3	31.5	29.5
63.2	71.8	63.6	67.6	76.5	67.5	65.6	75.6	66.5	58.7	67.9	59.6	47.4	55.3	48.7	34.4	39.5	35.0	26.4	29.8	27.5
65.5	72.2	65.2	70.0	76.1	70.0	67.9	75.3	68.3	61.3	68.5	62.5	50.9	57.3	52.5	38.6	43.1	39.8	30.9	34.3	32.6
64.8	72.3	65.9	69.0	76.4	69.8	66.8	75.5	68.7	59.7	69.1	62.2	49.4	58.2	52.2	36.5	42.1	38.0	28.2	32.2	29.5
65.2	72.4	66.5	70.0	77.4	72.0	68.4	76.4	71.0	61.9	70.4	64.4	52.3	59.6	54.8	38.5	44.3	40.2	31.0	34.4	32.0
67.2	75.2	67.3	70.5	79.7	71.5	67.5	77.8	69.9	59.4	70.5	62.4	49.1	58.9	52.5	36.9	43.1	38.8	28.3	33.4	30.4
63.5	73.9	65.0	67.0	78.4	69.1	65.3	77.0	68.3	58.0	69.3	60.9	47.7	57.4	50.8	35.0	41.0	36.8	26.9	31.3	28.4
57.9	63.7	56.9	63.2	70.2	62.8	61.3	70.0	62.0	53.8	62.3	54.9	42.3	49.9	44.0	30.3	34.9	31.2	21.6	26.1	22.9
57.7	63.8	56.8	63.1	72.6	63.8	61.1	70.9	63.1	52.6	61.9	55.0	42.0	49.2	44.2	28.3	33.4	30.4	18.1	23.7	20.1
63.5	65.8	62.0	68.1	73.2	66.8	65.8	72.8	66.2	58.1	65.6	59.3	47.5	54.7	49.7	35.1	39.7	37.0	27.8	30.8	29.1
58.0	64.9	56.8	59.8	66.4	59.4	59.6	67.4	59.4	55.2	62.3	55.9	46.1	52.1	47.5	33.9	38.0	35.2	24.3	26.9	25.2
57.0	63.6	56.4	63.0	70.6	62.0	62.0	70.7	62.2	53.5	62.4	54.1	43.0	50.1	44.5	28.7	33.3	30.4	20.2	24.7	21.4
60.6	68.0	60.4	65.6	73.5	65.8	64.1	73.4	65.9	57.4	67.1	59.2	46.4	54.8	48.3	34.9	39.5	34.8	24.8	29.0	26.4
63.3	69.1	64.0	69.5	76.0	70.9	68.2	75.8	67.0	59.8	69.2	63.6	46.7	57.5	52.2	35.3	42.1	38.3	26.7	32.4	29.2
61.0	66.9	61.4	66.3	73.4	66.9	65.4	73.6	67.2	56.9	66.1	59.9	45.7	54.2	48.4	31.4	37.8	34.3	21.6	27.2	24.3
55.1	63.3	56.6	62.6	72.6	63.4	62.1	71.8	63.7	52.2	61.7	54.9	41.3	49.7	44.4	25.2	32.4	29.7	12.1	20.4	15.2
61.7	72.9	65.4	65.7	79.4	69.8	63.4	77.7	68.0	52.6	66.6	57.4	42.3	53.8	45.7	28.4	35.0	29.5	15.0	22.4	17.8
63.4	74.9	68.1	67.4	79.6	72.5	65.0	78.2	70.3	56.0	67.8	60.7	45.3	55.6	49.8	29.7	37.8	33.0	18.9	26.1	22.5
65.6	76.5	69.2	69.6	81.5	73.9	67.4	80.2	72.2	58.3	71.7	63.0	47.5	58.2	52.2	33.0	42.2	36.7	24.1	31.2	27.1
63.6	76.9	68.2	67.0	81.4	72.0	66.1	81.8	71.6	57.0	72.2	62.4	47.8	60.8	51.8	32.1	43.2	36.3	20.0	28.1	22.8
68.8	78.5	67.0	68.5	81.8	72.5	67.5	80.3	70.2	56.7	70.4	61.0	46.1	61.8	55.0	30.6	40.0	34.7	21.4	29.6	25.2
68.8	78.6	67.4	72.7	84.0	72.1	69.5	83.1	73.8	60.3	74.1	64.5	49.0	62.0	55.6	34.0	44.0	37.7	24.9	32.6	28.3
71.3	81.6	73.4	75.3	85.5	76.7	73.0	84.6	75.8	63.5	77.4	67.9	53.7	67.9	58.0	41.1	51.5	45.4	34.2	42.6	37.8
66.6	77.6	70.2	70.7	83.2	74.8	67.6	81.7	72.8	59.3	74.6	65.0	52.1	67.4	58.6	37.5	46.9	41.2	28.8	34.8	31.6
69.5	81.0	73.2	73.7	85.1	77.3	70.9	83.8	75.6	62.0	76.0	67.5	51.6	65.3	56.8	38.0	48.1	42.3	30.4	38.1	34.0
68.2	81.0	72.4	72.1	85.0	76.6	69.4	84.4	75.0	60.1	75.8	65.6	48.5	64.4	54.8	34.4	46.8	38.8	25.6	35.6	29.4
66.2	78.7	70.0	70.4	83.4	74.6	67.9	82.4	72.8	56.6	72.1	62.3	45.7	61.0	51.8	30.3	42.2	35.1	20.2	29.8	24.0
60.1	77.6	66.8	62.9	80.7	68.8	61.2	82.4	67.6	50.2	72.0	58.2	43.0	58.4	44.6	21.8	33.9	26.7	12.1	25.4	17.2
58.8	74.9	65.1	61.1	76.8	66.9	60.0	78.6	67.4	49.4	68.7	55.7	39.7	55.4	45.8	24.4	38.1	32.7	12.8	25.0	15.8
62.6	76.7	66.4	67.0	81.4	71.6	64.0	82.0	67.0	52.6	72.0	60.0	41.8	58.4	47.2	25.8	40.4	33.0	15.2	27.1	18.9
57.5	73.3	63.5	59.4	74.8	65.0	58.2	75.5	64.7	47.4	64.9	53.7	36.0	49.9	41.9	18.6	30.1	22.2	5.2	15.2	8.6
55.0	71.0	60.4	56.0	72.6	61.8	55.1	73.8	61.8	44.4	62.2	50.5	33.7	46.7	38.5	15.6	24.3	18.0	2.0	9.6	3.7
57.6	72.3	61.6	61.8	78.5	67.3	58.9	78.2	66.3	45.9	66.6	53.9	35.7	53.0	41.1	13.7	31.9	23.7	9.1	18.8	12.0
55.8	73.8	62.6	58.0	77.5	64.9	55.6	79.0	65.3	43.6	66.6	52.0	34.8	51.4	40.2	13.5	31.6	23.1	3.8	14.1	6.3
54.4	71.9	64.2	56.2	75.7	66.8	55.6	75.4	66.0	44.9	61.9	52.8	34.5	48.9	39.9	22.8	33.9	27.9	14.3	20.4	16.2
53.5	73.2	62.9	58.6	79.6	68.2	57.5	79.4	68.6	45.6	65.5	55.2	34.2	50.2	41.0	23.8	37.8	28.9	14.5	22.0	19.3
55.6	73.6	64.4	58.9	80.1	70.8	58.8	80.9	67.9	45.7	68.8	57.7	36.5	55.7	45.2	23.4	41.8	29.8	12.9	24.6	16.9
53.8	68.0	61.4	59.7	73.2	66.8	59.9	73.5	68.1	50.1	61.5	56.3	37.5	47.0	42.3	25.9	33.3	29.4	17.9	23.3	20.0
53.8	68.0	56.2	54.8	70.2	56.8	55.8	75.0	59.7	46.6	61.8	48.7	34.8	45.9	37.4	27.7	39.5	31.4	17.0	25.0	18.3
50.4	62.0	56.5	55.3	73.9	62.7	55.3	77.4	63.3	44.2	29.6	44.2	32.8	55.4	42.1	14.4	32.8	23.2	-6.3	4.2	-4.0
49.9	62.0	56.0	51.5	74.6	63.5	50.5	75.5	63.8	43.1	62.9	51.1	35.0	48.0	39.0	26.0	37.0	29.0	18.0	26.2	20.3
54.4	67.9	58.6	56.9	72.0	62.4	55.9	72.9	61.7	46.3	63.7	52.0	39.0	51.1	42.2	27.2	43.0	30.3	17.4	27.0	20.0
51.6	73.5	59.2	55.6	79.3	65.3	54.1	77.6	67.0	44.4	69.1	52.9	35.8	55.7	41.1	27.7	41.5	29.8	22.7	34.7	24.7
60.4	78.0	66.6	65.6	83.2	71.7	63.1	82.8	70.2	51.7	77.7	59.8	40.1	61.3	47.6	25.4	45.9	31.9	18.2	28.5	22.3
56.1	77.8	66.6	61.7	83.1	71.7	60.0	81.0	70.0	49.9	72.8	60.6	40.8	61.4	44.9	29.6	47.7	35.4	23.9	38.7	27.8
28.8	37.7	31.1	33.3	45.4	38.1	34.7	43.9	37.1	27.1	36.8	29.9	18.0	25.9	20.1	8.4	18.7	10.1	4.5	8.5	5.2
58.6	80.5	67.5	63.2	88.1	74.0	60.2	84.7	71.5	52.4	79.5	64.4	42.0	65.7	52.0	23.6	53.8	33.3	19.8	40.8	26.4
65.0	83.1	70.6	69.3	87.5	75.3	66.9	85.2	73.0	58.0	78.8	65.0	45.9	66.6	53.2	30.0	49.7	36.6	23.1	40.2	28.6
63.7	83.0	72.9	66.5	85.5	75.9	64.8	84.0	73.2	58.6	79.0	66.2	49.2	67.4	55.6	32.8	52.0	38.2	26.4	43.9	31.2
70.6	86.7	76.1	73.5	90.7	79.7	71.0	89.7	79.0	63.4	83.8	71.5	54.3	72.8	61.1	39.5	57.0	45.6	30.4	45.8	36.0
71.1	86.7	75.7	74.1	93.0	80.4	70.2	90.7	77.7	64.6	88.4	71.8	56.7	76.6	62.2	43.4	61.5	48.8	37.6	55.8	43.1
66.0	85.6	72.9	67.6	84.8	73.6	63.7	89.0	77.3	58.2	76.9	65.9	52.2	71.5	59.5	40.4	60.7	48.7	35.0	50.0	42.8
68.7	86.9	74.7	71.0	91.5	79.8	67.9	88.5	77.6	62.2	82.9	70.4	54.2	74.8	61.7	41.8	62.2	47.7	36.8	56.8	43.0
69.8	92.9	80.0	73.0	92.8	80.8	69.9	89.1	77.5	62.3	83.8	71.5	53.4	75.7	61.7	41.4	61.5	49.0	37.8	55.9	45.2
48.6	85.0	67.1	160.2	85.2	71.4	58.9	81.6	68.7	49.1	178.5	61.3	38.9	66.1	151.0	27.6	56.7	73.4	25.3	34.9	1.4

*Mean a. m., p. m., and midnight temperatures, in degrees Fahrenheit, at stations*

Stations.	January.			February.			March.			April.			May.		
	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.
<b>Southern Plateau—Continued:</b>															
Grant, Fort, Ariz.	35.0	50.1	44.2	39.0	53.4	45.0	43.4	60.4	51.5	47.9	67.5	57.4	56.7	77.1	63.2
Prescott, Ariz.	23.4	45.0	32.3	25.7	47.4	37.1	31.2	55.8	42.5	36.8	61.7	48.3	42.8	70.1	56.0
Thomas, Camp, Ariz.	29.9	50.1	40.5	36.2	56.3	47.7	41.6	63.6	54.6	44.9	72.5	60.9	52.1	83.2	69.9
Yuma, Ariz.	45.6	62.5	52.8	49.9	67.8	57.7	53.6	75.0	65.1	56.4	80.7	70.0	64.3	89.0	77.9
<b>Middle Plateau:</b>															
Salt Lake City, Utah	25.0	33.2	27.9	28.4	38.2	32.2	28.1	47.9	41.1	42.0	55.6	48.5	49.9	64.9	56.9
<b>Northern Plateau:</b>															
Boisé City, Idaho.	22.7	34.2	30.5	27.5	38.1	34.7	35.3	49.9	44.6	40.5	57.4	51.7	46.7	65.9	58.2
Lewiston, Idaho.	29.0	34.0	31.8	26.4	34.2	30.8	37.1	43.3	44.3	43.0	57.3	52.2	48.9	66.0	60.9
Dayton, Wash.	28.2	35.2	29.3	24.0	35.8	27.6	35.5	25.0	41.0	40.6	53.8	24.7	9.45	7.67	0.55.0
Spokane Falls, Wash.	19.7	26.4	24.9	19.0	27.8	25.7	31.8	43.7	40.5	39.4	54.0	48.8	45.0	63.5	58.6
<b>North Pacific Coast:</b>															
Canby, Fort, Wash.	41.6	43.1	43.0	35.1	40.0	39.4	41.3	46.5	44.3	43.0	52.8	50.6	50.7	56.2	53.2
Olympia, Wash.	35.6	40.8	38.1	35.4	41.4	38.7	39.0	43.2	45.2	41.6	53.4	49.3	44.7	59.3	55.6
Tatoosh Island, Wash.	39.9	42.2	42.4	35.3	37.1	37.4	41.3	44.4	42.4	47.2	51.3	49.0	48.5	53.1	51.0
Portland, Oreg.	36.9	42.4	39.4	38.1	45.1	41.3	42.2	51.6	47.7	44.6	57.7	52.5	48.7	62.7	57.7
Roseburg, Oreg.	37.1	42.8	40.4	37.5	47.1	42.3	40.5	52.4	48.9	43.2	57.0	52.0	45.9	63.2	57.6
<b>Middle Pacific Coast:</b>															
Cape Mendocino, Cal.	44.4	48.4	46.7	41.8	47.3	44.7	45.9	51.6	48.5	45.4	50.9	47.3	48.8	54.1	50.0
Red Bluff, Cal.	40.3	49.7	46.2	42.7	53.0	49.4	46.9	50.5	55.5	50.5	65.6	59.9	56.3	74.2	67.5
Sacramento, Cal.	41.1	49.9	46.8	44.0	53.3	50.5	48.6	59.4	55.4	51.0	63.5	58.5	55.0	70.2	64.5
San Francisco, Cal.	47.8	53.0	51.0	48.5	54.9	51.8	49.9	57.4	53.0	50.6	59.0	53.4	52.2	61.6	55.3
<b>South Pacific Coast:</b>															
Los Angeles, Cal.	45.6	60.6	51.1	46.9	61.8	52.5	48.5	63.6	54.2	50.8	66.7	56.0	53.8	71.7	59.8
San Diego, Cal.	48.1	60.6	52.6	49.2	60.4	53.6	50.9	61.3	54.9	52.6	63.6	57.0	54.7	66.2	60.1
<b>Alaska Stations:</b>															
Saint Michael's, Fort, Alaska.	4.8	8.2	7.6	-3.5	0.1	0.7	5.0	10.5	11.8	13.8	20.6	23.2	28.4	34.9	36.3
Sitka, Alaska.	36.3	37.7	36.8	31.0	34.1	33.0	34.7	39.3	37.2	38.9	45.6	43.9	43.6	49.0	47.9
Unalashka, Alaska.	31.3	34.0	33.7	31.5	32.3	32.2	30.7	33.8	33.4	32.0	36.7	36.0	36.9	40.8	41.6
Behring's Island, Behring Sea.	25.5	25.4	26.3	28.2	28.3	30	26.0	25.8	28.4	28.0	29.0	32.0	34.2	35.6	38.1

of the Signal Service, United States Army, for each month of the year, &c.—Continued.

June.			July.			August.			September.			October.			November.			December.		
a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.
66.2	86.1	76.0	69.8	85.9	77.8	87.5	82.5	78.9	82.9	79.8	70.5	58.6	70.7	60.9	42.1	58.9	49.1	37.2	53.3	44.6
51.5	81.0	67.6	61.0	84.0	73.0	59.5	80.8	69.5	50.1	76.6	62.4	40.1	66.0	50.7	29.8	55.4	38.8	26.7	48.7	34.8
61.6	94.1	80.9	71.8	94.8	83.6	70.0	90.5	80.1	59.7	85.3	73.2	46.6	74.0	60.9	35.1	61.1	47.8	33.2	53.8	43.0
71.4	98.8	86.8	80.4	103.8	93.1	80.1	101.4	91.0	71.8	96.0	83.7	61.6	83.6	70.8	51.6	71.5	56.2	47.3	65.4	54.3
59.4	76.8	66.9	60.5	84.8	74.6	65.9	83.8	74.1	55.9	73.5	63.1	46.0	59.2	50.3	33.9	44.7	37.6	29.2	37.4	31.7
54.0	76.1	68.7	58.6	83.5	75.2	58.0	88.3	75.1	49.0	66.6	61.4	38.3	56.0	48.8	31.9	44.2	38.3	28.2	36.5	32.1
56.7	74.0	69.9	61.6	79.7	76.9	60.0	79.1	76.9	51.1	66.5	61.5	43.0	54.4	49.5	34.2	42.4	38.0	29.4	34.3	31.6
52.0	74.2	62.8	55.0	80.0	67.1	54.4	80.5	65.3	48.3	70.1	56.1	41.0	56.8	48.6	38.7	43.0	35.9	27.7	34.3	20.4
53.2	70.8	67.3	55.6	76.2	72.0	54.3	76.8	70.7	46.2	68.8	57.0	38.7	49.8	45.3	31.8	39.5	34.6	24.0	30.6	28.0
52.9	57.3	55.4	56.0	61.7	58.2	58.0	64.0	60.1	55.6	60.2	57.2	50.1	52.6	51.0	47.8	50.6	49.0	39.0	41.9	40.2
49.3	64.6	61.6	51.6	67.8	64.8	53.1	68.6	64.5	49.0	61.6	56.4	45.1	53.1	48.3	41.1	48.9	43.5	37.7	41.8	39.0
50.6	55.8	53.4	52.9	56.8	55.6	53.8	58.8	57.0	50.9	54.5	53.2	47.6	50.5	49.2	45.6	47.1	46.8	38.4	40.0	39.8
53.7	68.2	63.5	58.7	72.6	68.8	56.1	71.9	67.2	52.7	67.6	61.4	47.7	58.4	52.5	42.2	48.7	44.8	38.4	43.3	40.8
51.1	60.3	63.9	53.8	73.6	68.9	53.1	73.1	68.1	49.6	68.0	62.2	44.2	56.3	50.4	39.8	47.1	43.6	38.5	43.6	41.0
51.8	57.6	54.2	51.2	56.0	54.2	52.5	57.1	55.4	54.6	60.0	56.9	50.7	55.8	53.3	49.2	53.7	51.2	47.5	50.3	49.4
63.7	84.8	70.4	68.4	91.4	86.3	67.1	90.9	84.2	61.1	80.6	73.8	53.2	70.0	62.3	46.5	59.6	52.2	41.8	51.6	47.0
59.0	77.9	70.2	60.8	82.8	73.8	60.2	82.3	73.0	58.7	78.7	69.6	51.5	68.5	61.0	44.9	58.5	53.0	42.4	51.5	47.6
54.4	64.0	57.4	54.7	63.3	58.9	55.1	63.5	57.2	55.7	65.2	58.3	55.1	64.0	58.4	52.3	59.0	55.7	49.0	53.9	52.1
58.1	75.9	66.2	60.2	80.0	64.7	60.9	81.4	66.2	58.4	79.3	64.8	54.1	73.1	60.2	49.5	68.9	55.0	47.9	63.3	52.9
60.5	69.6	68.2	63.5	72.5	65.7	65.0	73.9	76.1	62.5	72.1	65.4	58.0	69.0	61.3	52.6	63.7	56.6	50.0	62.5	54.1
41.6	47.8	49.2	50.1	55.1	55.9	44.6	48.6	49.2	41.2	45.3	45.1	28.2	31.5	31.0	14.8	17.5	16.7	8.5	6.1	5.6
48.1	53.2	52.3	50.8	55.8	54.8	52.2	58.2	57.0	49.2	54.2	52.2	42.9	47.4	45.0	39.0	40.6	39.4	34.7	35.8	35.2
43.3	47.3	47.6	47.8	50.7	51.4	48.8	53.0	53.6	45.6	49.8	49.3	38.7	42.4	42.1	33.4	30.3	35.7	32.0	32.2	32.0
40.9	41.6	45.0	45.4	46.8	50.6	50.2	51.1	54.1	45.3	46.5	49.3	37.6	38.9	39.6	33.9	30.0	30.3	27.6	28.0	28.2

## APPENDIX 25.

*Average temperature (in degrees Fahrenheit) of the surface of the ocean at stations of the Signal Service, United States Army, on the Atlantic and Gulf coasts for each month and the year. (Computed from observations taken at 2 p. m. (Washington time) daily, and from the date observations began to December 31, 1884.)*

Stations.	Observations began.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Eastport, Me.	May, 1874	35.7	33.0	32.7	35.4	39.1	42.9	46.7	49.6	50.5	49.7	48.0	40.7	41.8
Portland, Me.	December, 1873	33.4	32.0	33.1	39.3	47.0	55.0	59.5	60.9	58.0	52.4	46.0	36.9	41.8
Boston, Mass.	May, 1881	33.2	32.4	35.1	42.4	51.8	60.3	64.2	64.2	62.8	51.0	44.5	36.8	46.0
Block Island, R. I.	May, 1881	36.1	35.8	37.4	43.8	49.8	58.4	65.3	67.0	64.9	57.7	43.0	33.8	48.4
New London, Conn.	April, 1874	36.0	35.3	38.7	45.6	49.8	58.6	65.3	67.0	64.9	57.7	43.0	33.8	48.4
New Haven, Conn.	May, 1881	32.4	32.0	36.5	45.5	54.4	63.5	71.4	73.1	68.8	58.6	48.0	41.4	50.6
New York City.	December, 1873	33.3	32.7	33.9	43.7	54.8	63.4	72.4	73.0	69.3	60.0	48.3	37.5	52.2
Sandy Hook, N. J.	May, 1881	37.3	36.7	38.2	47.4	53.3	63.4	71.0	72.9	71.2	61.4	50.9	41.1	54.5
Atlantic City, N. J.	May, 1880	36.5	37.9	41.5	47.6	53.1	63.3	71.9	72.6	71.5	63.3	51.0	41.1	54.5
Delaware Breakwater, Del.	March, 1880	37.2	41.9	44.1	52.3	63.0	75.3	80.0	78.6	75.8	66.6	51.7	42.0	59.2
Chincoteague, Va.	May, 1880	41.9	45.1	50.2	56.2	67.5	76.0	80.8	80.4	74.9	65.4	54.4	43.8	61.3
Norfolk, Va.	December, 1873	41.0	45.1	50.2	60.6	72.4	76.3	81.4	79.8	77.3	70.6	61.4	53.2	68.3
Fort Monroe, N. C.	July, 1883	43.9	57.3	56.0	62.6	71.6	78.9	83.7	81.2	76.9	69.3	59.4	49.7	65.6
Wilmington, N. C.	December, 1873	47.6	60.8	56.0	62.6	71.6	78.9	83.7	81.2	76.9	69.3	59.4	49.7	65.6
Smithville, N. C.	December, 1879	46.7	51.8	56.5	64.4	72.3	78.6	83.2	81.8	78.6	71.2	60.8	53.5	66.4
Charleston, S. C.	April, 1874	56.9	63.6	58.5	64.4	72.3	78.6	83.2	81.8	78.6	71.2	60.8	53.5	66.4
Savannah, Ga.	December, 1873	49.9	54.1	58.9	61.5	72.9	80.0	84.5	82.9	78.5	71.3	60.5	50.8	67.4
Jacksonville, Fla.	December, 1873	57.8	61.4	66.9	71.3	78.4	83.5	86.6	85.5	82.2	73.5	67.5	59.4	73.0
Key West, Fla.	June, 1874	71.8	73.8	75.7	78.7	82.6	86.1	87.3	86.4	85.9	81.4	76.7	71.6	79.8
Cedar Key, Fla.	December, 1879	60.3	64.9	67.3	72.5	79.1	83.0	85.8	85.5	84.1	77.6	67.0	61.9	74.1
Pensacola, Fla.	December, 1873	55.8	62.6	65.0	71.1	78.5	83.0	85.0	84.7	82.5	77.1	68.3	63.5	72.4
Mobile, Ala.	April, 1881	50.5	54.2	59.6	65.5	74.2	82.4	86.7	84.9	81.9	74.6	63.7	53.6	69.2
Galveston, Tex.	December, 1873	54.8	57.7	64.1	70.8	78.3	84.2	88.4	85.6	81.5	75.8	64.1	57.7	71.7
Indianola, Tex.	May, 1874	54.1	59.8	68.0	71.6	78.3	84.5	88.4	87.0	82.7	77.9	66.4	59.8	72.8



## APPENDIX 26.

*Mean temperature (in degrees Fahrenheit) and average precipitation (in inches and hundredths) at stations of the Signal Service, United States Army, for each season of the year. (Computed from the commencement of observations at each, to and including December, 1864.)*

[The mean temperature is deduced from the three telegraphic observations, taken at the same moment of Washington time at all stations. The seasons comprise the following months: Spring: March, April, and May; summer: June, July, and August; autumn: September, October, and November; and winter: December, January, and February. Observations prior to Aug. 25, 1872, were taken at 7.35 a. m., 4.35 and 11.35 p. m. (Washington time); from Aug. 25, 1872, to Nov. 1, 1879, at 7.35 a. m., 4.35 and 11.00 p. m. (Washington time), and from Nov. 1, 1879, to Dec. 31, 1884, at 7.00 a. m., 3.00 and 11.00 p. m. (Washington time).]

Stations.	Established.	Mean temperature.				Average precipitation.			
		Spring.	Summer.	Autumn.	Winter.	Spring.	Summer.	Autumn.	Winter.
<b>New England:</b>									
Eastport, Me.....	Apr. 1, 1873	87.9	58.8	46.0	22.4	13.48	12.48	12.92	11.34
Portland, Me.....	Jan. 15, 1871	43.6	67.8	49.8	26.8	9.54	10.56	10.27	9.68
Mount Washington, N.H.	Dec. 1, 1870	21.5	46.3	29.1	7.0	19.49	27.98	22.67	13.60
Boston, Mass.....	Nov. 1, 1870	44.8	69.0	51.2	28.2	12.49	11.95	12.31	11.50
Block Island, R. I.....	Sept. 1, 1880	43.5	68.4	55.0	33.2	13.50	12.28	12.78	16.36
New Haven, Conn.....	Dec. 10, 1872	46.4	70.2	52.9	29.5	13.04	13.92	11.66	12.19
New London, Conn.....	Jan. 10, 1871	45.6	68.9	62.7	30.1	12.43	18.30	11.67	11.27
<b>Middle Atlantic States:</b>									
Albany, N. Y.....	Dec. 22, 1873	45.8	70.6	51.2	25.9	8.70	11.96	9.13	8.23
New York City.....	Nov. 1, 1870	47.7	71.5	54.6	31.5	10.16	12.86	10.15	10.25
Philadelphia, Pa.....	Jan. 1, 1871	50.5	73.7	58.4	33.4	9.25	12.94	9.53	9.21
Atlantic City, N. J.....	Dec. 10, 1873	47.4	70.4	56.2	33.9	10.07	11.61	9.75	11.80
Barnegat City, N. J.....	Dec. 10, 1873	46.9	70.1	55.7	33.1	11.51	12.68	12.74	13.27
Cape May, N. J.....	May 24, 1871	48.0	71.6	57.8	35.8	10.95	12.73	11.16	12.46
Sandy Hook, N. J.....	Dec. 10, 1873	47.4	71.9	56.2	32.6	14.03	13.45	12.18	11.69
Del. Breakwater, Del.....	Jan. 28, 1880	48.4	71.3	58.4	36.3	7.20	8.74	7.27	9.86
Baltimore, Md.....	Jan. 1, 1871	53.3	75.9	57.1	36.3	10.14	12.54	9.93	9.44
Washington City.....	Nov. 1, 1870	53.0	76.4	56.6	35.0	10.25	13.42	9.90	9.52
Cape Henry, Va.....	Dec. 15, 1873	55.0	76.8	62.3	42.3	14.87	15.06	13.27	13.09
Chincoteague, Va.....	Mar. 16, 1880	50.3	72.3	63.2	37.2	8.81	10.83	8.51	12.62
Lynchburg, Va.....	May 24, 1871	56.1	76.3	57.7	38.8	10.48	10.67	9.66	11.40
Norfolk, Va.....	Jan. 1, 1871	57.0	77.3	60.7	42.2	12.18	15.70	11.95	11.78
<b>South Atlantic States:</b>									
Charlotte, N. C.....	Oct. 6, 1878	59.6	77.1	61.5	43.8	13.30	14.65	10.52	16.00
Hatteras, N. C.....	Dec. 1, 1880	57.1	76.6	60.4	46.4	17.51	17.61	20.32	18.17
Kitty Hawk, N. C.....	Jan. 15, 1875	35.4	76.1	63.3	43.8	14.99	19.82	15.72	15.12
Macon, Fort. N. C.....	May 23, 1878	58.8	77.2	66.0	47.3	13.81	18.30	13.59	13.46
Smithville, N. C.....	Oct. 15, 1875	61.6	79.0	65.2	48.4	10.35	15.16	14.74	10.59
Wilmington, N. C.....	Jan. 1, 1871	62.0	78.5	64.0	48.2	11.95	20.50	14.29	11.05
Charleston, S. C.....	Jan. 5, 1871	65.0	81.0	68.8	51.2	13.90	19.99	14.80	11.23
Augusta, Ga.....	Nov. 2, 1870	64.2	80.2	64.5	48.8	13.40	13.42	10.21	12.40
Savannah, Ga.....	Jan. 1, 1871	66.6	81.1	68.9	52.9	11.78	19.45	11.47	10.00
Jacksonville, Fla.....	Sept. 11, 1871	69.1	81.4	69.9	56.8	10.47	17.79	16.70	9.74
<b>Florida Peninsula:</b>									
Cedar Keys, Fla.....	Nov. 7, 1879	70.3	81.7	72.4	60.1	8.86	24.10	11.72	11.18
Key West, Fla.....	Nov. 1, 1870	76.9	83.8	78.8	70.8	6.10	13.47	14.80	5.04
Sanford, Fla.....	Sept. 1, 1882	71.6	80.5	78.3	61.6	8.41	22.35	10.23	4.73
<b>Eastern Gulf States:</b>									
Atlanta, Ga.....	Sept. 25, 1878	61.3	76.5	62.4	46.1	15.70	11.36	9.86	19.16
Pensacola, Fla.....	Oct. 27, 1879	67.9	80.3	69.5	56.0	14.34	22.58	15.52	14.92
Mobile, Ala.....	Nov. 7, 1870	67.2	81.2	67.7	52.6	18.86	19.18	13.19	14.26
Montgomery, Ala.....	Nov. 9, 1870	65.3	80.6	65.5	50.4	16.94	11.79	8.92	15.50
Vicksburg, Miss.....	Sept. 10, 1871	66.0	80.8	65.5	50.4	19.55	11.37	13.45	16.69
New Orleans, La.....	Nov. 1, 1870	69.0	81.9	69.9	56.0	17.80	18.44	13.28	14.77
<b>Western Gulf States:</b>									
Shreveport, La.....	Sept. 3, 1871	66.1	81.9	65.2	48.9	16.26	9.17	12.82	15.37
Fort Smith, Ark.....	June 1, 1882	59.4	77.7	62.8	37.7	9.90	9.01	12.98	18.91
Little Rock, Ark.....	July 1, 1879	62.3	78.8	63.1	45.3	18.38	10.82	11.50	18.57
Galveston, Tex.....	Apr. 19, 1871	69.9	83.5	71.4	55.5	10.83	13.21	17.20	11.77
Indianola, Tex.....	May 1, 1872	70.4	82.8	71.5	55.6	7.54	9.28	13.79	7.01
Palestine, Tex.....	Dec. 3, 1881	65.5	79.9	67.1	48.6	17.75	7.98	14.26	10.12

Mean temperature (in degrees Fahrenheit) and average precipitation (in inches and hundredths) at stations of the Signal Service, &c.—Continued.

Stations.	Established.	Mean temperature.				Average precipitation.			
		Spring.	Summer.	Autumn.	Winter.	Spring.	Summer.	Autumn.	Winter.
<b>Rio Grande Valley:</b>		°	°	°	°	Inches.	Inches.	Inches.	Inches.
Brownsville, Tex.....	Aug. 25, 1875	74.3	83.5	78.6	60.4	4.59	9.08	13.07	5.89
Rio Grande City, Tex.....	May 23, 1875	76.0	85.2	73.3	60.3	4.75	7.37	6.37	3.49
<b>Ohio Valley and Tennessee:</b>									
Chattanooga, Tenn.....	Jan. 8, 1879	60.1	76.2	61.3	44.2	16.39	12.18	11.65	19.63
Knoxville, Tenn.....	Jan. 1, 1871	57.2	74.8	57.7	39.7	14.98	13.31	10.03	15.58
Memphis, Tenn.....	Feb. 28, 1871	61.3	79.5	60.9	42.7	17.65	11.81	11.23	15.77
Nashville, Tenn.....	Nov. 1, 1870	59.7	78.5	59.7	41.2	14.65	12.62	10.25	14.58
Louisville, Ky.....	Sept. 11, 1871	55.7	76.7	57.6	37.2	12.87	12.44	9.78	13.44
Indianapolis, Ind.....	Feb. 10, 1871	52.3	74.4	54.1	31.9	11.89	14.35	9.72	10.08
Cincinnati, Ohio.....	Nov. 1, 1870	54.6	76.1	58.9	36.2	10.73	12.91	8.59	11.51
Columbus, Ohio.....	July 1, 1878	50.9	73.0	54.7	31.9	11.11	11.10	9.33	11.00
Pittsburg, Pa.....	Nov. 1, 1870	50.1	72.8	53.3	32.3	8.32	11.54	7.64	8.57
<b>Lower Lakes:</b>									
Buffalo, N. Y.....	Nov. 1, 1870	41.9	67.9	50.2	26.4	8.33	9.73	10.32	8.60
Oswego, N. Y.....	Nov. 1, 1870	43.1	68.1	50.9	27.4	8.02	9.06	9.21	9.40
Rochester, N. Y.....	Nov. 1, 1870	43.3	68.6	49.7	25.7	9.15	9.74	8.38	9.10
Erie, Pa.....	May 25, 1873	45.0	70.0	52.7	29.7	9.26	10.44	13.02	10.25
Cleveland, Ohio.....	Nov. 1, 1870	45.8	69.9	52.0	28.2	8.71	11.82	9.51	8.00
Sandusky, Ohio.....	Aug. 2, 1877	48.0	71.0	54.0	30.6	8.93	13.00	10.05	8.43
Toledo, Ohio.....	Nov. 1, 1870	47.5	71.8	52.3	29.3	7.73	10.36	8.05	6.60
Detroit, Mich.....	Nov. 1, 1870	45.2	69.7	50.8	26.9	8.76	10.75	7.98	7.41
<b>Upper Lakes:</b>									
Alpena, Mich.....	Sept. 10, 1872	36.4	63.1	44.8	20.2	7.79	11.03	12.22	6.60
Escanaba, Mich.....	May 24, 1871	35.8	64.0	44.2	17.2	7.48	12.34	10.99	4.40
Grand Haven, Mich.....	May 24, 1871	43.4	67.5	49.6	26.9	8.93	10.82	11.24	7.02
Mackinaw City, Mich.....	Aug. 20, 1882	34.3	61.0	47.3	18.1	5.28	8.98	8.51	15.58
Marquette, Mich.....	May 1, 1871	36.9	63.1	44.6	19.3	6.02	10.02	11.39	4.65
Port Huron, Mich.....	July 25, 1874	41.2	66.4	49.0	24.2	9.21	9.60	8.38	6.74
Chicago, Ill.....	Nov. 1, 1870	46.0	69.8	51.7	27.6	10.42	10.87	9.50	6.50
Milwaukee, Wis.....	Nov. 1, 1870	42.0	66.9	48.3	23.1	9.48	10.25	8.05	5.70
Duluth, Minn.....	Nov. 1, 1870	37.1	63.5	43.5	14.9	7.84	13.03	9.47	3.54
<b>Upper Mississippi Valley:</b>									
Saint Paul, Minn.....	Nov. 1, 1870	43.9	69.5	45.7	17.0	7.31	11.98	6.95	3.44
La Crosse, Wis.....	Oct. 15, 1872	46.2	71.1	48.4	20.4	7.37	13.40	9.89	3.03
Davenport, Iowa.....	May 24, 1871	48.6	72.9	51.5	23.6	9.89	12.52	8.51	4.93
Des Moines, Iowa.....	Aug. 1, 1878	48.5	72.0	51.4	23.1	10.35	16.10	10.50	4.29
Dubuque, Iowa.....	July 10, 1873	47.4	71.6	49.8	23.2	9.36	14.45	10.42	4.82
Keokuk, Iowa.....	July 16, 1871	50.9	75.1	53.3	28.0	9.67	13.06	9.29	5.60
Cairo, Ill.....	June 1, 1871	57.9	77.6	58.5	38.2	12.79	11.57	9.90	12.53
Springfield, Ill.....	July 1, 1879	52.3	73.9	55.2	31.2	12.47	12.15	11.08	10.97
Saint Louis, Mo.....	Nov. 1, 1870	54.7	76.7	56.3	31.1	10.23	11.62	8.24	7.74
<b>Missouri Valley:</b>									
Leavenworth, Kans.....	May 21, 1871	53.0	76.0	54.3	29.6	11.19	14.13	9.11	4.62
Omaha, Nebr.....	Nov. 1, 1870	49.3	74.1	50.8	24.2	9.95	16.21	8.06	2.41
Bennett, Fort, Dak.....	Dec. 22, 1879	42.6	70.3	45.2	15.0	6.13	7.18	2.02	2.07
Huron, Dak.....	July 1, 1881	41.4	67.7	45.1	14.0	7.88	12.08	4.29	0.94
Yankton, Dak.....	April 1, 1873	44.8	71.4	47.5	18.7	8.63	11.84	4.88	2.22
<b>Extreme Northwest:</b>									
Moorhead, Minn.....	Jan. 1, 1881	36.0	65.8	40.5	4.2	5.92	12.93	7.28	3.12
Saint Vincent, Minn.....	Sept. 5, 1880	32.5	63.0	37.1	-0.3	8.91	8.78	5.32	1.37
Bismarck, Dak.....	Sept. 15, 1874	38.8	66.9	41.4	10.2	7.24	8.81	3.45	2.05
Buford, Fort, Dak.....	Oct. 23, 1878	38.9	65.8	40.3	8.0	3.93	6.31	2.18	2.22
<b>Northern Slope:</b>									
Assinaboine, Fort, Mont.....	Oct. 6, 1879	40.8	65.1	40.7	13.6	3.15	7.85	3.77	2.00
Benton, Fort, Mont.....	Oct. 11, 1879	42.5	67.3	42.6	17.5	4.47	7.40	2.73	1.96
Custer, Fort, Mont.....	Dec. 5, 1878	43.4	68.2	44.9	18.6	4.91	4.88	2.24	2.89
Helena, Mont.....	Oct. 15, 1879	42.1	65.0	42.6	18.4	2.78	4.53	3.76	4.42
Maginnia, Fort, Mont.....	July 14, 1882	38.0	61.5	41.3	17.0	2.75	2.31	2.89	2.77
Poplar River, Mont.....	May 1, 1882	40.8	66.2	40.2	-1.4	3.01	3.17	2.30	1.08
Shaw, Fort, Mont.....	Apr. 1, 1880	40.6	62.1	41.2	19.5	2.94	4.64	3.51	2.57
Deadwood, Dak.....	Dec. 25, 1877	40.1	66.6	42.9	25.2	12.27	8.56	8.41	3.42
Cheyenne, Wyo.....	Nov. 1, 1870	41.1	64.5	44.3	25.6	3.95	4.60	1.90	0.62
North Platte, Nebr.....	Sept. 13, 1874	47.0	71.3	48.6	24.0	5.57	8.97	3.05	1.74
<b>Middle Slope:</b>									
Denver, Colo.....	Nov. 19, 1871	47.4	69.8	49.6	29.9	5.57	4.94	2.34	1.83
Pike's Peak, Colo.....	Nov. 1, 1873	14.0	37.1	21.4	4.1	9.31	10.52	5.26	4.15
West Las Animas, Colo.....	Oct. 1, 1881	48.8	72.0	51.6	25.2	5.14	5.58	1.11	1.38
Dodge City, Kans.....	Sept. 15, 1874	52.6	75.1	53.7	30.2	6.41	9.91	3.07	1.53
Elliot, Fort, Tex.....	Nov. 29, 1879	54.8	74.4	55.4	33.7	6.68	9.15	6.52	1.46
<b>Southern Slope:</b>									
Sill, Fort, Ind. T.....	June 23, 1875	61.5	79.0	61.0	38.9	8.82	10.57	7.32	5.25
Concho, Fort, Tex.....	Oct. 10, 1875	65.1	80.7	63.2	45.0	7.73	9.89	8.60	3.83
Davis, Fort, Tex.....	Dec. 24, 1877	61.3	74.0	59.3	45.5	2.41	11.68	5.04	1.20

Mean temperature (in degrees Fahrenheit) and average precipitation (in inches and hundredths) at stations of the Signal Service, &c.—Continued.

Stations.	Established.	Mean temperature.				Average precipitation.			
		Spring.	Summer.	Autumn.	Winter.	Spring.	Summer.	Autumn.	Winter.
Southern Slope—Continued:		°	°	°	°	Inches.	Inches.	Inches.	Inches.
Stockton, Fort, Tex. ....	Feb. 26, 1876	64.8	79.2	62.0	46.0	2.39	6.88	8.13	1.81
Southern Plateau:									
Santa Fé, N. Mex. ....	Nov. 20, 1871	46.9	66.4	48.4	30.2	1.98	7.56	3.18	1.90
El Paso, Tex. ....	Nov. 5, 1877	64.0	80.6	62.2	47.2	1.10	5.94	3.44	2.02
Apache, Fort, Ariz. ....	Oct. 9, 1877	50.5	69.6	52.4	36.1	3.21	10.32	4.62	5.55
Grant, Fort, Ariz. ....	Nov. 1, 1875	58.7	76.2	60.9	44.4	2.10	8.04	2.86	3.91
Prescott, Ariz. ....	Nov. 18, 1873	49.4	69.7	52.2	35.4	2.00	5.58	2.35	4.57
Thomas, Camp, Ariz. ....	Sept. 22, 1877	60.4	80.7	60.1	43.4	2.29	4.50	1.86	3.58
Yuma, Ariz. ....	Nov. 18, 1873	70.2	89.6	73.9	56.1	0.39	0.47	0.10	1.51
Middle Plateau:									
Winnemucca, Nev. ....	July 1, 1877	47.1	63.9	47.2	30.9	2.83	0.95	1.50	3.40
Salt Lake City, Utah. ....	Mar. 19, 1874	49.2	72.5	51.6	31.5	6.59	2.10	4.18	4.18
Northern Plateau:									
Boise City, Idaho. ....	July 1, 1877	50.0	70.3	48.5	31.3	2.70	1.23	2.95	6.54
Lewiston, Idaho. ....	July 1, 1879	50.9	70.6	48.9	31.1	2.49	3.05	3.98	7.52
Dayton, Wash. ....	July 1, 1879	49.1	65.7	47.9	30.2	6.85	2.21	5.71	12.94
Spokane Falls, Wash. ....	Feb. 5, 1881	47.2	66.3	45.4	25.2	4.10	2.77	5.90	8.21
North Pacific Coast:									
Canby, Fort, Wash. ....	Sept. 1, 1883	49.3	58.2	52.8	40.4	6.46	5.13	16.86	17.54
Olympia, Wash. ....	July 1, 1877	48.5	60.7	49.4	33.8	12.35	2.89	15.74	28.16
Tatoosh Island, Wash. ....	Oct. 1, 1883	47.6	55.2	49.5	39.2	10.17	11.20	24.13	30.82
Portland, Oreg. ....	Nov. 1, 1871	51.6	64.4	52.8	40.6	12.72	2.35	13.78	23.14
Roseburg, Oreg. ....	July 15, 1877	51.2	64.1	51.7	41.0	8.72	1.92	7.81	17.53
Middle Pacific Coast:									
Cape Mendocino, Cal. ...	July 27, 1882	49.1	54.5	53.9	46.7	6.78	0.80	4.06	6.91
Red Bluff, Cal. ....	July 1, 1877	59.8	79.7	63.2	46.8	7.84	0.33	4.05	15.91
Sacramento, Cal. ....	July 1, 1877	58.6	71.1	60.5	47.3	8.37	0.81	2.54	11.85
San Francisco, Cal. ....	Mar. 8, 1871	54.6	58.5	56.2	51.3	6.06	0.35	3.91	14.10
South Pacific Coast:									
Los Angeles, Cal. ....	July 1, 1877	58.4	67.8	62.7	53.6	6.01	0.22	1.55	10.43
San Diego, Cal. ....	Nov. 1, 1871	58.1	66.8	62.6	54.6	2.63	0.30	1.19	6.75
Alaska Stations:									
Alexander, Fort, Alaska.	Aug. 1, 1881	-----	-----	-----	-----	6.55	9.17	10.85	8.49
Saint Michael's, Fort, Alaska. ....	June 23, 1874	20.7	50.8	30.2	2.7	1.79	5.19	5.00	1.77
Sitka, Alaska. ....	Mar. 30, 1881	42.1	51.6	45.6	35.0	12.19	14.95	24.40	32.21
Unalakha, Alaska. ....	Aug. 18, 1878	35.7	48.8	40.8	32.4	17.09	10.74	23.28	30.97
Behring's Island, Beh- ring Sea. ....	May 22, 1882	30.8	47.1	33.6	24.1	2.06	5.68	7.84	4.65

## APPENDIX 27.

*Normal precipitation and departure (of 1884) therefrom at stations of the Signal Service, commencement of observations*

Stations.	Established.	January.		February.		March.		April.		May.			
		Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -		
<b>New England:</b>													
Eastport, Me.	Apr. 1, 1873	3.26	+1.11	4.24	+5.12	5.29	-1.55	3.67	+3.16	4.52	+2.27		
Portland, Me.	Jan. 15, 1871	3.32	+1.22	3.32	+3.70	3.35	+1.61	3.04	+3.38	3.25	+3.27		
Mount Washington, N. H.	Dec. 1, 1870	4.14	-1.69	4.15	-3.40	6.75	-2.59	5.89	-2.60	6.85	+2.69		
Boston, Mass.	Nov. 1, 1870	4.19	+2.08	3.68	-2.06	4.96	-0.10	4.06	+0.70	3.47	-0.16		
Thatcher's Island, Mass.	Dec. 26, 1875	1.30	+3.36	4.04	-3.50	5.64	-0.94	4.27	-1.06	3.50	+0.89		
Block Island, R. I.	Sept. 1, 1880	5.28	+1.15	6.47	-0.84	8.44	+1.56	3.58	+0.52	5.08	+1.31		
New Haven, Conn.	Dec. 10, 1872	4.24	+0.39	4.34	+1.23	5.20	-1.05	4.16	-1.80	3.68	-0.36		
New London, Conn.	Jan. 10, 1871	4.12	+2.00	3.63	+1.99	5.06	+0.47	3.91	+0.08	3.46	+2.18		
<b>Middle Atlantic States:</b>													
Albany, N. Y.	Dec. 22, 1873	2.74	+0.24	2.84	+1.01	2.94	+1.06	2.80	-0.71	2.96	-0.17		
New York City.	Nov. 1, 1870	3.68	+2.39	3.36	+1.73	4.09	+0.34	3.21	-0.55	2.86	+1.49		
Philadelphia, Pa.	Jan. 1, 1871	3.41	+2.05	3.20	+2.50	3.38	+1.32	3.04	-1.41	2.83	+0.56		
Atlantic City, N. J.	Dec. 10, 1873	3.98	+3.19	3.46	+3.98	4.13	+1.66	3.66	+0.63	2.28	-0.66		
Barnegat City, N. J.	Dec. 10, 1873	4.99	+0.26	3.71	-2.60	5.06	-2.68	3.81	-2.84	2.64	-1.85		
Cape May, N. J.	May 24, 1871	4.32	+1.24	3.80	-2.42	5.18	+0.43	3.26	-0.92	2.51	-1.32		
Sandy Hook, N. J.	Dec. 10, 1873	4.30	+2.46	3.51	+1.21	5.39	-1.07	4.35	-1.40	4.09	-1.18		
Delaware Breakwater, Del.	Jan. 28, 1880	4.07	+0.12	3.23	+2.91	4.07	+2.64	1.78	+0.04	1.35	-0.47		
Baltimore, Md.	Jan. 1, 1871	3.18	+1.63	3.29	+3.40	4.11	+2.26	3.19	-0.54	2.84	+0.33		
Washington City	Nov. 1, 1870	3.34	+2.25	3.14	+3.70	4.27	+2.97	2.99	-1.13	2.99	+0.10		
Cape Henry, Va.	Dec. 15, 1873	5.11	+3.32	3.59	-0.28	6.19	+1.46	5.49	-2.60	3.19	-2.41		
Chincoteague, Va.	Mar. 16, 1880	4.02	+0.27	4.23	+1.61	4.45	+3.36	2.89	-0.88	1.97	-0.85		
Lynchburg, Va.	May 24, 1871	4.05	+4.43	3.44	+5.64	4.05	+4.09	3.55	-1.20	2.88	-0.14		
Norfolk, Va.	Jan. 1, 1871	4.04	+1.90	3.90	+0.68	4.60	+4.44	4.12	-2.17	3.37	-2.12		
<b>South Atlantic States:</b>													
Charlotte, N. C.	Oct. 6, 1878	6.10	-1.50	4.65	+1.78	5.66	+3.53	4.84	+0.56	2.80	+2.04		
Hatteras, N. C.	Dec. 1, 1880	6.50	+1.14	5.25	-0.07	7.84	-2.00	5.78	-2.27	3.89	-1.23		
Kitty Hawk, N. C.	Jan. 15, 1875	6.13	+0.37	3.75	+0.57	6.31	+2.86	5.76	-0.93	2.99	-1.17		
Macon, Fort, N. C.	May 23, 1878	5.98	-0.25	3.10	-0.76	6.08	-1.98	4.25	-1.78	3.48	-0.10		
Smithville, N. C.	Oct. 15, 1875	4.00	-0.56	3.08	-0.20	4.16	-1.36	3.48	-1.11	2.71	-1.29		
Wilmington, N. C.	Jan. 1, 1871	3.95	+1.27	3.45	+0.35	4.46	+1.61	3.36	-0.91	4.13	-0.43		
Charleston, S. C.	Jan. 5, 1871	3.92	+1.97	3.69	+0.60	4.46	+0.07	4.92	-1.47	4.52	-2.84		
Augusta, Ga.	Nov. 2, 1870	4.48	-0.14	3.98	+0.00	5.74	+1.23	4.52	-0.84	3.14	+0.07		
Savannah, Ga.	Jan. 1, 1871	3.44	+0.45	3.14	+0.30	4.72	+0.79	4.78	-1.00	2.88	-1.66		
Jacksonville, Fla.	Sept. 11, 1871	3.39	+1.39	3.37	-0.92	3.09	-0.46	3.46	-1.14	3.92	+1.58		
<b>Florida Peninsula:</b>													
Cedar Keys, Fla.	Nov. 7, 1879	5.26	-0.18	2.70	-1.14	3.31	-1.10	2.98	+0.60	2.57	-0.61		
Key West, Fla.	Nov. 1, 1870	2.28	-0.40	1.83	-0.13	0.63	-0.47	1.39	-0.41	1.08	-3.78		
Sanford, Fla.	Sept. 1, 1882	1.20	-0.29	2.20	+2.20	1.22	-0.28	5.17	-8.27	2.02	-0.40		
<b>Eastern Gulf States:</b>													
Atlanta, Ga.	Sept. 25, 1878	7.15	-1.95	5.99	-0.15	7.16	+2.54	5.82	+0.04	2.72	-1.39		
Pensacola, Fla.	Oct. 27, 1879	5.08	-1.39	4.48	-1.05	4.87	+1.38	5.00	+0.67	4.97	+1.67		
Mobile, Ala.	Nov. 7, 1870	4.94	+2.40	4.58	+0.43	7.88	+3.65	6.02	-0.48	4.96	+3.52		
Montgomery, Ala.	Nov. 9, 1870	4.58	+0.24	5.51	-0.71	6.77	+2.73	6.46	-3.89	3.71	-2.53		
Vicksburg, Miss.	Sept. 10, 1871	5.50	+2.70	5.32	+1.41	6.94	+1.85	6.92	-2.45	5.99	+6.07		
New Orleans, La.	Nov. 1, 1870	5.44	-1.09	4.27	-1.11	5.93	+2.31	6.35	+0.13	5.62	-1.19		
<b>Western Gulf States:</b>													
Shreveport, La.	Sept. 3, 1871	4.75	-0.20	5.20	+0.29	5.02	-0.24	6.01	+0.59	5.23	+9.24		
Fort Smith, Ark.	June 1, 1882	2.03	-0.68	1.17	+2.55	1.74	+0.54	3.48	-0.86	4.68	-0.93		
Little Rock, Ark.	July 1, 1879	4.75	-1.30	8.60	+1.13	0.53	-0.36	0.28	+3.96	7.07	+0.26		
Galveston, Tex.	Apr. 19, 1871	3.89	+1.22	2.92	-2.03	3.14	+0.70	7.24	+2.31	4.45	+3.97		
Indianola, Tex.	May 1, 1872	1.96	-1.25	1.83	-1.79	2.60	-0.69	1.58	+0.88	3.86	+4.58		
Palestine, Tex.	Dec. 8, 1881	3.05	-0.74	3.39	-0.92	3.78	-0.16	4.75	+2.55	9.22	+8.03		
<b>Rio Grande Valley:</b>													
Brownsville, Tex.	Aug. 25, 1875	1.99	-0.89	1.69	-1.69	1.22	-1.15	0.65	-0.08	3.02	+2.84		
Rio Grande City, Tex.	May 28, 1875	1.05	-0.58	1.06	-1.06	1.12	-0.96	0.88	+0.05	2.75	+2.40		
<b>Ohio Valley and Tennessee:</b>													
Chattanooga, Tenn.	Jan. 8, 1879	7.93	-2.05	5.70	+3.11	7.00	+3.19	5.84	+0.11	3.55	-1.33		
Knoxville, Tenn.	Jan. 1, 1871	5.94	+0.72	5.16	+3.35	5.93	+6.00	5.78	-1.34	3.25	-1.06		
Memphis, Tenn.	Feb. 28, 1871	5.90	-0.24	5.80	-3.84	6.17	-1.09	6.63	+1.97	4.80	+1.60		
Nashville, Tenn.	Nov. 1, 1870	5.16	+2.04	5.58	+2.60	5.46	+0.83	6.06	-2.16	3.53	+0.05		
Louisville, Ky.	Sept. 11, 1871	4.06	-2.12	4.86	+4.98	4.37	+0.41	4.57	-1.66	3.93	+1.82		
Indianapolis, Ind.	Feb. 10, 1871	2.79	-1.74	3.77	+0.96	4.14	-1.15	3.45	-0.56	4.30	+0.50		
Cincinnati, Ohio	Nov. 1, 1870	3.45	-1.24	4.08	+4.79	3.88	-1.23	3.22	-0.20	3.65	+1.91		

## APPENDIX 27.

United States Army, for each month of the year. (The normal has been computed from the to December, 1884, inclusive.)

June.		July.		August.		September.		October.		November.		December.	
Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -
Inch.	Inches.	Inch.	Inches.	Inch.	Inches.	Inch.	Inches.	Inch.	Inches.	Inch.	Inches.	Inch.	Inches.
4.10	-1.92	5.12	+2.36	3.26	+1.15	3.64	-1.75	4.50	-2.68	4.72	+1.23	3.84	+4.79
3.48	-2.07	8.70	+3.08	3.88	+0.80	2.97	-2.41	3.56	-1.85	3.74	-1.49	3.14	+3.28
9.45	-1.37	10.90	+13.00	7.63	+1.00	8.90	-1.38	7.35	+5.56	6.62	+1.37	5.40	+0.70
3.65	+0.58	3.93	+0.32	4.87	+0.64	3.07	-2.76	4.18	-1.01	5.06	-2.08	3.68	+0.83
2.85	-0.06	4.15	-1.22	3.89	+1.81	2.56	-1.79	3.79	-0.93	6.38	-3.09	4.15	+1.67
4.98	-2.89	3.82	+2.70	3.48	+2.83	3.40	-2.78	5.01	-1.12	4.87	+1.58	4.01	+1.95
3.36	+1.90	4.94	+0.95	5.62	-0.02	3.92	-2.51	3.74	-1.25	4.00	-1.76	3.61	+2.80
3.57	+2.72	4.44	+1.48	5.19	+1.94	3.38	-2.06	4.17	-1.04	4.12	-1.34	3.52	+3.84
4.06	-2.28	4.53	+0.51	3.85	+1.92	3.48	-1.68	3.08	-0.44	2.57	+0.87	2.75	+0.45
3.38	+0.78	4.58	+1.56	4.90	+3.06	3.61	-3.49	3.16	+0.47	3.35	+0.09	3.21	+3.45
3.58	-0.58	4.37	+0.54	4.99	-0.69	3.47	-3.27	2.86	-1.33	3.20	-0.89	2.00	+0.68
3.34	+0.26	3.15	+1.58	5.12	-1.08	3.50	-3.16	2.81	+0.18	3.44	+0.59	4.36	+3.35
8.77	-1.53	4.04	+0.81	4.87	+0.17	5.05	-4.00	3.48	-1.27	4.23	-1.55	4.57	+2.52
3.01	-2.58	3.28	+1.06	5.78	-0.43	4.16	-3.85	3.87	-2.04	3.63	-1.33	3.84	+2.53
4.36	-0.16	4.28	+2.04	4.71	+0.41	4.70	-4.67	3.41	+0.80	4.07	-0.50	3.88	+1.76
2.37	-1.00	2.68	-0.56	3.69	+0.50	2.31	-1.32	2.68	-1.56	2.29	+0.14	2.56	+0.06
3.84	-1.33	4.44	+4.99	4.26	-2.62	4.03	-3.94	2.86	-1.44	3.04	+0.05	3.17	+0.74
4.42	+2.53	4.32	+3.07	4.68	-3.67	4.11	-3.97	2.91	-1.18	2.88	+0.54	3.04	+1.66
3.76	-1.24	6.17	+1.47	5.13	-2.57	5.23	-4.81	3.93	-3.19	4.11	-3.53	4.39	+0.90
2.47	+1.13	4.01	+1.91	4.35	-3.25	3.00	-2.17	3.12	-2.00	2.89	-0.77	4.07	+1.68
3.46	+0.70	3.06	-0.74	4.15	-1.30	3.48	-2.22	2.85	-2.81	3.35	+0.28	3.91	+7.90
4.31	+2.14	5.51	+1.55	5.88	-2.93	4.87	-4.70	3.71	-3.24	3.37	-2.63	3.84	+0.52
4.21	+5.26	5.77	+2.13	4.67	-2.59	3.23	+0.34	3.23	-1.72	4.06	+0.67	5.25	+0.47
4.73	-2.22	6.64	+3.87	6.24	-0.85	7.35	-6.34	6.69	-5.46	6.28	+6.74	6.42	+0.99
4.73	-0.16	7.19	+3.57	7.90	-1.32	6.08	-5.98	4.38	-3.15	5.26	+1.88	5.24	+0.41
5.44	-3.81	6.60	-2.38	6.17	+0.69	7.48	-1.92	3.31	-2.97	2.80	+0.26	4.38	+1.02
3.38	-1.07	6.27	+1.05	5.51	-0.13	6.46	-3.35	5.26	-5.03	3.02	-1.21	3.51	+0.58
5.07	+1.87	6.38	+1.91	8.05	+1.53	7.78	+1.56	3.76	-3.13	2.75	-0.79	3.65	+0.07
6.28	+2.97	7.35	+2.17	7.36	-1.24	6.77	+4.26	4.67	-4.32	3.36	-1.87	3.62	+0.86
4.15	+0.19	4.43	-1.18	4.84	-0.48	3.96	+0.26	2.13	-1.30	4.10	-2.39	3.94	+0.25
6.92	+2.45	4.86	-1.18	7.67	+0.74	5.24	-0.69	3.69	-1.40	2.64	-0.82	3.42	-0.21
5.50	+1.39	5.25	+0.77	7.04	-1.83	7.15	-1.47	6.43	-2.31	3.12	+2.31	2.96	+1.06
6.15	+0.53	8.48	-2.46	9.47	-1.86	5.52	-1.89	3.35	-3.22	2.85	+0.21	3.23	+2.44
4.09	+0.47	4.13	-1.77	5.25	-2.09	6.60	+0.43	5.68	-2.51	2.52	+3.51	1.83	-0.15
9.07	+0.50	4.36	+1.21	8.92	+2.17	3.63	+0.20	5.70	-2.06	0.90	+0.55	1.33	+1.18
4.25	+6.48	3.26	-0.84	3.85	-1.79	2.78	-2.65	2.46	-1.76	4.67	-1.83	6.02	+0.07
5.63	+2.21	6.42	+2.37	10.48	-8.41	6.78	-1.90	4.28	-1.85	4.51	+0.65	5.36	+0.24
5.62	+1.39	6.48	-1.52	7.08	-5.82	5.03	-3.25	3.84	+1.52	4.32	-0.20	4.74	+0.36
4.78	+5.48	3.65	-0.85	3.36	-0.31	2.77	-2.19	2.59	-0.72	3.56	-0.89	5.41	-1.41
3.80	-0.66	4.14	+1.61	4.43	-1.27	4.14	+0.98	3.52	-2.44	5.79	-3.31	5.87	+7.95
6.22	+2.38	6.60	-2.48	8.62	-4.75	4.30	-1.18	3.57	+2.03	5.41	-2.28	5.06	+2.95
3.22	+1.00	3.94	-3.88	2.01	-0.02	4.21	-2.11	3.68	+3.14	4.98	+0.80	5.42	+10.13
2.88	-0.47	4.00	+1.98	2.13	+1.60	4.39	+0.64	4.54	-3.22	4.05	+1.14	3.71	+2.59
3.28	-1.10	3.69	+0.54	3.85	-0.59	3.16	+1.84	3.44	-2.14	4.90	-2.07	5.17	+11.75
4.26	+2.58	3.60	-2.44	5.85	-3.58	6.25	+0.79	5.75	+1.62	5.20	-0.96	4.96	+4.48
2.74	+4.52	2.41	-2.08	4.18	-2.85	6.75	+2.65	3.94	+4.00	3.10	-0.25	3.23	-1.17
3.27	-0.62	2.62	-2.56	2.09	-1.43	2.75	+1.25	5.39	-3.84	6.22	-3.29	3.68	+3.26
1.85	+0.89	2.36	-2.13	4.87	-3.09	5.85	+2.11	4.69	+11.02	2.53	+0.93	3.21	-0.88
1.85	-1.33	1.58	-1.58	4.44	-4.44	3.06	+4.24	2.45	+2.00	0.98	-0.33	1.38	-1.05
4.29	+4.91	3.63	+1.16	4.26	-1.72	3.74	-1.74	3.37	-1.44	4.64	-2.89	6.00	+0.80
4.46	+0.87	4.50	+4.00	4.26	+0.49	2.92	-2.26	2.94	+0.89	4.17	-2.86	4.48	+1.63
5.32	+1.94	2.84	-0.46	3.15	-1.88	2.96	+1.83	3.75	-0.92	4.52	-2.44	4.07	+5.07
4.20	-2.33	5.00	-1.82	3.42	-0.61	3.34	-0.98	3.02	-0.59	3.89	-2.32	3.84	-0.06
4.49	-0.90	4.39	-0.45	3.56	+1.25	2.79	+3.11	3.40	-1.40	3.59	-1.73	4.52	+0.59
5.45	-1.34	3.80	+0.23	3.10	-2.64	2.62	-0.47	3.38	-1.07	3.72	-2.26	3.52	+2.53
4.79	-2.02	4.10	-2.37	4.02	-1.97	2.29	+1.58	2.98	-1.03	3.32	-2.09	3.98	+0.01

## Normal precipitation and departure (of 1884)

Stations.	Established.	January.		February.		March.		April.		May.	
		Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -
Ohio Valley and Tennessee—											
Continued:											
Columbus, Ohio .....	July 1, 1878	3.09	-0.84	4.11	+0.84	3.62	-0.03	2.98	-0.87	4.51	-0.72
Pittsburg, Pa. ....	Nov. 1, 1870	3.02	+1.80	2.54	+2.03	3.09	+0.62	2.48	-1.37	2.75	+0.73
Lower Lakes:											
Buffalo, N. Y. ....	Nov. 1, 1870	2.66	+0.70	2.54	+1.49	2.98	-0.14	2.36	-6.80	2.99	+0.93
Owego, N. Y. ....	Nov. 1, 1870	3.16	+3.33	2.58	+0.40	3.24	+0.57	2.00	-1.12	2.78	-0.39
Rochester, N. Y. ....	Nov. 1, 1870	3.44	+1.69	2.62	-0.68	4.00	+0.10	2.52	-1.58	3.23	-0.95
Erie, N. Y. ....	May 25, 1873	3.44	+1.15	3.37	+2.51	3.19	+0.65	2.52	-0.53	3.55	-0.13
Cleveland, Ohio. ....	Nov. 1, 1870	2.43	-0.68	2.81	+2.46	3.07	-1.20	2.44	-0.69	3.20	+0.40
Sandusky, Ohio. ....	Aug. 2, 1877	2.05	-0.80	3.47	+2.01	2.92	+0.31	2.58	-1.08	3.40	+0.30
Toledo, Ohio. ....	Nov. 1, 1870	2.09	+0.52	2.02	+1.01	2.26	-0.17	2.27	-0.70	3.20	+1.51
Detroit, Mich. ....	Nov. 1, 1870	2.13	-0.05	2.48	+0.91	2.82	-0.72	2.31	-0.77	3.63	-1.25
Upper Lakes:											
Alpena, Mich. ....	Sept. 10, 1872	2.12	+0.95	2.15	+0.63	2.03	-0.42	1.82	-1.07	3.04	-0.67
Escanaba, Mich. ....	May 24, 1871	1.28	-0.73	1.40	+1.35	1.71	-0.61	1.84	+0.76	3.93	-1.24
Grand Haven, Mich. ....	May 24, 1871	2.31	+0.52	2.14	+0.58	2.61	+1.25	2.72	-1.11	3.60	-0.01
Mackinaw City, Mich. ....	Aug. 20, 1882	6.63	+1.46	4.04	+1.06	1.36	-0.15	0.84	-0.15	3.08	-1.41
Marquette, Mich. ....	May 1, 1871	1.15	-0.24	1.40	+0.65	1.34	-0.60	1.70	-2.24	2.98	-0.55
Port Huron, Mich. ....	July 25, 1874	1.92	-0.29	2.40	+0.78	3.86	+0.02	2.25	-0.33	3.10	-1.39
Chicago, Ill. ....	Nov. 1, 1870	1.99	-0.60	2.35	+0.92	2.96	+2.20	3.66	-0.55	3.86	-2.33
Milwaukee, Wis. ....	Nov. 1, 1870	1.96	-0.27	1.97	+0.64	2.82	-0.05	3.01	-0.14	3.65	-1.98
Duluth, Minn. ....	Nov. 1, 1870	1.01	-0.34	1.15	+1.56	1.65	-0.33	2.16	+1.48	4.03	+1.14
Upper Mississippi Valley:											
Saint Paul, Minn. ....	Nov. 1, 1870	1.03	-0.55	1.08	+0.19	1.62	-0.28	2.09	-0.09	3.60	-1.51
La Crosse, Wis. ....	Oct. 15, 1872	1.17	-0.64	1.18	+0.24	1.80	-0.69	2.04	-1.03	3.43	-1.61
Davenport, Iowa. ....	May 24, 1871	1.67	-0.92	1.57	-0.59	2.36	+0.13	3.07	-2.30	3.46	-0.67
Des Moines, Iowa ....	Aug. 1, 1878	1.02	-0.17	1.73	+0.19	1.84	+0.70	2.64	-0.33	3.67	-1.83
Dubuque, Iowa. ....	July 10, 1873	1.43	-0.44	1.59	+0.60	2.44	+1.41	2.91	-0.14	4.01	+0.87
Keokuk, Iowa. ....	July 16, 1871	1.60	-0.75	1.75	+0.13	2.38	-0.99	3.10	-1.79	4.19	-1.03
Cairo, Ill. ....	June 1, 1871	4.24	-1.92	4.56	+1.02	4.19	-0.01	4.32	-0.67	4.28	+0.29
Springfield, Ill. ....	July 1, 1879	1.90	-0.39	5.69	-1.45	3.36	-0.34	3.19	-0.70	5.02	-2.13
Saint Louis, Mo. ....	Nov. 1, 1870	2.09	-1.30	3.20	+1.23	3.04	-0.04	3.41	+0.74	3.78	-1.10
Missouri Valley:											
Leavenworth, Kans. ....	May 21, 1871	1.32	-0.35	1.58	-0.16	2.49	+1.21	3.65	+1.09	5.06	-0.26
Omaha, Nebr. ....	Nov. 1, 1870	0.56	+0.17	0.85	+0.57	1.58	+3.33	3.35	-0.53	5.02	-3.57
Bennett, Fort, Dak. ....	Dec. 22, 1879	0.84	-0.57	0.74	+0.17	1.23	-0.15	2.28	+0.07	2.62	+0.07
Huron, Dak. ....	July 1, 1881	0.13	-0.04	0.43	+0.15	0.92	+0.61	3.01	-0.31	3.95	-1.05
Yankton, Dak. ....	April 1, 1873	0.58	-0.33	0.88	+0.92	1.20	-0.28	3.10	+2.63	4.58	-3.15
Extreme Northwest:											
Moorhead, Minn. ....	Jan. 1, 1881	0.92	-0.37	1.25	+0.07	1.22	-0.19	1.34	-0.11	3.36	-1.61
Saint Vincent, Minn. ....	Sept. 5, 1880	0.34	-0.20	0.47	-0.23	0.56	-0.18	0.81	-0.01	2.34	-1.43
Bismarck, Dak. ....	Sept. 15, 1874	0.56	-0.18	0.68	+0.19	1.15	-0.55	2.86	-0.66	3.23	-0.67
Buford, Fort, Dak. ....	Oct. 23, 1878	0.74	-0.63	0.50	-0.38	0.52	-0.42	1.26	+0.04	2.16	-2.01
Northern Slope:											
Assinaboine, Fort, Mont. ....	Oct. 6, 1879	1.28	-1.12	0.52	-0.08	0.77	-0.24	0.89	-0.64	1.49	+1.56
Benton, Fort, Mont. ....	Oct. 11, 1879	0.80	-0.24	0.50	( <sup>1</sup> )	0.77	( <sup>1</sup> )	0.87	( <sup>1</sup> )	2.83	-1.74
Custer, Fort, Mont. ....	Dec. 5, 1878	1.33	+1.52	0.50	+0.79	0.53	+0.49	1.17	-0.40	3.21	-2.02
Helena, Mont. ....	Oct. 15, 1879	2.06	+1.69	0.74	+0.59	0.41	+0.18	1.26	-0.20	1.11	-0.48
Maginnis, Fort, Mont. ....	July 14, 1882	1.38	+0.09	0.64	+0.05	1.01	-0.45	0.50	+0.12	1.24	-0.48
Poplar River, Mont. ....	May 1, 1882	0.38	-0.07	0.42	-0.01	0.54	( <sup>1</sup> )	0.76	+0.15	1.71	-0.93
Shaw, Fort, Mont. ....	April 1, 1880	1.17	-0.31	0.48	-0.36	0.56	-0.14	0.71	-0.12	1.67	-0.93
Deadwood, Dak. ....	Dec. 25, 1877	0.92	-0.07	0.95	+0.06	1.78	+0.83	5.05	-2.76	5.44	-3.72
Cheyenne, Wyo. ....	Nov. 1, 1870	0.27	+0.49	0.14	+0.12	0.56	+1.03	1.06	-0.27	2.33	+2.50
North Platte, Nebr. ....	Sept. 18, 1874	0.60	+0.50	0.39	-0.16	0.64	+1.18	1.84	+0.30	3.09	-0.69
Middle Slope:											
Denver, Colo. ....	Nov. 19, 1871	0.66	-0.44	0.46	+0.40	0.87	+0.06	1.83	+1.50	3.17	+1.44
Pike's Peak, Colo. ....	Nov. 1, 1873	1.61	-1.51	1.28	-0.52	1.98	-1.59	3.32	-2.89	4.01	-1.11
West Las Animas, Colo. ....	Oct. 1, 1881	0.20	+0.06	0.35	+0.15	0.48	+0.71	0.99	+0.06	3.67	+0.79
Dodge City, Kans. ....	Sept. 15, 1874	0.26	-0.18	0.56	-0.27	0.82	+1.09	1.24	-0.17	4.35	+0.12
Elliott, Fort, Tex. ....	Nov. 20, 1879	0.28	+0.33	0.35	-0.08	0.26	+0.03	0.80	+0.28	5.62	+0.67
Southern Slope:											
Concho, Fort, Tex. ....	Oct. 10, 1875	1.12	+0.14	1.24	-0.76	1.24	-0.43	1.98	+3.66	4.51	+8.99
Davis, Fort, Tex. ....	Dec. 24, 1877	0.62	-0.14	0.17	-0.17	0.27	+0.01	0.60	-0.10	3.14	-0.46
Stockton, Fort, Tex. ....	Feb. 28, 1876	0.28	-0.07	0.83	+0.05	0.58	-0.46	0.42	+0.49	1.39	+0.27
Southern Plateau:											
El Paso, Tex. ....	Nov. 5, 1877	0.70	-0.15	0.52	+0.32	0.55	-0.22	0.28	-0.68	0.32	-0.32
Apache, Fort, Ariz. ....	Oct. 9, 1877	1.29	-0.61	2.00	+1.43	1.81	+2.63	0.82	-0.85	0.58	+0.73
Grant, Fort, Ariz. ....	Nov. 1, 1875	0.78	+0.34	1.29	+3.33	1.42	+2.45	0.25	-0.22	0.43	+0.38
Phoenix, Ariz. ....	Aug. 18, 1876	0.56	-0.40	0.99	+1.47	0.83	+1.31	0.37	+0.03	0.08	-0.07
Prescott, Ariz. ....	Nov. 19, 1873	1.08	-0.83	1.45	+5.10	1.41	+4.10	0.92	-0.70	0.57	+0.88
San Carlos Agency, Ariz. ....	June 1, 1881	1.28	-0.28	2.28	+1.55	1.74	+2.23	0.28	+0.56	0.52	-0.20
Thomas, Camp, Ariz. ....	Sept. 22, 1877	0.51	-0.06	1.40	+1.54	1.61	+1.60	0.29	-0.43	0.39	+0.21
Verde, Fort, Ariz. ....	Nov. 9, 1874	0.72	-0.33	0.90	+2.60	1.36	+2.24	0.89	-0.54	0.37	+0.35
Wickenburg, Ariz. ....	Jan. 6, 1874	1.00	-0.81	1.20	+3.01	0.84	+2.89	0.52	-0.72	0.26	+0.38
Yuma, Ariz. ....	Nov. 18, 1873	0.38	-0.38	0.64	+0.04	0.24	+1.24	0.09	-0.02	0.06	+0.38

<sup>1</sup> Record incomplete.

therefrom at stations of the Signal Service, &amp;c.—Continued.

June.		July.		August.		September.		October.		November.		December.	
Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -
Inch.	Inches.	Inch.	Inches.	Inch.	Inches.	Inch.	Inches.	Inch.	Inches.	Inch.	Inches.	Inch.	Inches.
3.41	-1.22	3.71	-1.55	3.58	-2.88	2.47	+0.99	3.52	-1.86	3.34	-2.35	3.80	-1.03
2.57	-1.56	4.81	-0.77	3.16	-0.22	2.65	-1.48	2.55	-0.53	2.44	-1.26	3.01	+1.06
3.15	-0.35	3.67	+1.44	2.91	+1.65	3.04	-1.27	3.80	-2.26	3.48	-0.97	3.40	-0.33
3.34	-1.86	3.27	-1.87	2.45	-0.74	2.48	-0.56	3.47	-0.26	3.26	-1.17	3.66	-1.05
2.23	+1.07	3.48	-0.45	3.01	-0.49	2.32	-0.42	3.25	-1.38	2.81	-1.49	3.04	-0.42
3.95	-1.55	3.47	+1.82	3.02	-0.86	4.32	-0.40	4.04	-1.01	4.46	+0.45	3.44	+0.40
4.25	-0.96	4.28	+0.85	3.29	-1.04	3.90	-0.14	3.25	-1.08	2.56	-0.97	2.76	-0.98
4.62	-2.20	4.34	-1.41	4.04	-1.56	3.50	-0.33	3.21	-2.03	3.54	-2.23	2.91	-0.47
3.70	-1.00	2.76	-0.10	2.90	-1.42	2.45	-1.43	2.74	-0.60	2.86	-1.47	2.49	-0.46
3.80	-1.88	4.12	-0.36	2.83	-1.28	2.08	+0.02	2.80	-0.84	2.50	-0.76	2.80	+0.25
4.04	-1.37	3.54	-1.16	3.45	-0.76	4.66	+0.17	4.68	-0.93	2.88	-0.73	2.33	+3.25
4.79	-2.27	3.44	-0.43	4.17	+0.60	4.39	+4.38	3.98	+3.09	2.62	-0.48	1.72	+2.62
4.54	-0.72	3.41	+0.60	2.87	-3.57	3.02	+0.23	4.03	+2.07	3.29	-0.58	2.57	+4.23
2.93	-0.64	3.43	-0.92	2.62	+0.66	2.18	-0.22	3.20	+0.65	3.43	-0.54	5.21	+1.27
4.13	-2.92	3.35	-0.90	3.14	+2.32	5.23	-0.32	3.83	+2.09	2.33	+0.44	2.10	+6.55
3.86	-1.01	2.94	-0.90	2.78	-1.50	2.48	-0.61	3.23	-1.03	2.67	-0.33	2.42	+0.59
4.28	-2.17	3.94	-0.23	2.65	-0.15	2.78	-0.49	3.84	-0.25	2.68	-1.08	2.22	+1.99
4.07	+0.15	3.39	+0.41	2.79	-0.95	3.12	-0.30	3.80	-0.62	2.13	-0.68	1.83	-0.54
5.37	+4.24	4.10	-0.65	3.56	+3.36	4.58	+0.12	3.14	+0.83	1.75	-0.80	1.38	-0.16
5.02	-1.45	3.20	-0.27	3.76	-0.87	3.35	+1.13	2.23	+0.20	1.37	-0.73	1.33	+0.65
4.73	-1.79	5.02	-0.44	3.65	+0.17	5.12	+4.89	2.78	+0.47	1.99	-0.54	1.28	-0.97
4.99	-1.92	3.93	+0.58	3.60	-0.24	3.29	+1.50	3.11	+4.06	2.11	-0.62	1.69	+1.09
3.39	-4.55	4.00	+3.16	3.71	-0.13	3.19	+2.27	4.72	+0.61	2.59	-1.33	1.54	+0.39
5.65	-0.76	5.30	+0.00	3.50	+0.75	4.89	-0.82	3.20	+0.96	2.33	-0.90	1.80	+2.28
5.51	-1.48	4.67	-2.37	2.88	-0.14	3.64	+0.61	3.56	-0.21	2.09	-0.86	2.25	-1.16
4.52	-1.57	4.27	+3.07	2.78	-0.04	2.57	+2.45	3.31	-1.42	4.02	-1.61	3.73	+5.26
6.95	-0.75	2.66	+0.96	2.54	-1.00	3.26	+3.60	4.32	-1.58	3.50	-2.20	3.38	-1.81
4.80	-0.28	4.25	-1.39	2.47	-1.26	2.80	+3.24	2.75	-0.27	2.69	-0.39	2.45	+3.73
5.71	-2.38	5.13	+4.31	3.30	+1.35	3.26	+2.12	3.37	+0.04	2.48	-1.06	1.72	-0.24
6.73	-0.62	5.95	+4.40	3.53	+3.54	3.60	+1.31	3.10	+2.71	1.36	-1.04	1.00	-0.28
3.55	-0.45	2.33	+1.46	1.80	-0.58	1.19	-0.51	0.80	+0.16	0.29	-0.12	0.45	+0.01
4.46	-1.28	4.94	-0.17	2.68	-1.50	1.73	-0.47	2.24	-0.72	0.32	-0.15	0.38	-0.24
5.11	-3.39	4.14	+0.49	2.59	+0.02	2.73	-2.45	1.80	+0.17	0.35	-0.33	0.76	+0.04
3.80	-1.96	4.70	+2.62	4.43	+1.74	2.74	-0.25	3.43	+0.27	1.11	-0.77	0.95	-0.19
2.62	+0.01	2.48	-0.99	3.68	+3.50	2.14	+1.30	2.73	-1.58	0.45	-0.03	0.56	+0.29
3.64	-0.01	2.35	+1.27	2.82	+0.98	1.44	+0.90	1.30	-0.38	0.71	+0.02	0.81	-0.90
2.68	+1.69	2.49	-0.62	1.14	-0.08	0.87	+0.34	0.95	-0.51	0.36	-0.05	0.98	-0.58
2.18	+2.54	3.68	+5.99	1.99	+0.62	1.51	+1.18	0.65	-0.24	1.11	-0.69	0.80	-0.06
1.85	+0.33	1.81	+1.28	1.04	-0.25	1.10	+0.84	0.84	-0.48	0.79	-0.50	0.66	+0.35
2.51	+1.36	1.21	-0.41	1.16	+0.93	0.75	+0.67	0.99	-0.33	0.50	-0.13	1.06	-0.79
2.24	+2.05	1.35	+1.90	0.94	-0.47	1.86	-0.56	1.22	-0.73	0.68	-0.22	1.62	-0.06
1.08	+0.13	0.46	+0.18	0.77	+0.56	0.55	-0.29	1.73	-1.40	0.61	-0.30	0.75	+0.07
0.95	+0.72	1.39	+2.01	0.83	-0.15	0.81	-0.17	1.16	-0.70	0.33	+0.10	0.28	-0.06
2.23	-1.26	1.49	+1.17	0.92	-0.33	1.78	+0.51	1.04	-0.65	0.69	-0.15	0.94	+1.53
4.10	-1.59	2.50	+1.01	1.96	+1.11	0.80	+1.19	1.54	-0.06	1.07	+0.39	1.55	+0.24
1.42	+0.08	1.71	-1.11	1.47	+0.60	0.89	+0.86	0.75	-0.25	0.26	-0.08	0.21	+0.46
3.72	-2.33	2.96	-0.77	2.29	-0.16	1.40	-1.32	1.33	-0.59	0.32	-0.28	0.75	-0.48
1.59	-0.12	1.79	-1.14	1.56	+0.15	0.90	-0.77	0.74	-0.53	0.70	-0.51	0.71	+0.05
1.83	-0.89	4.53	-4.12	4.16	-3.91	1.93	-1.44	1.49	-0.50	1.94	-1.82	1.26	+0.24
2.64	+0.15	1.37	+0.38	1.57	+0.60	0.47	-0.41	0.48	-0.03	0.18	+0.14	0.83	-0.11
3.06	+4.61	3.40	+3.00	3.45	+1.37	1.07	-0.84	1.34	+0.16	0.66	+0.17	0.72	+0.38
2.98	+3.93	3.04	-1.75	3.18	+2.42	2.54	-1.70	3.25	+2.29	0.73	+1.41	0.83	+2.22
2.44	-0.35	3.70	-1.33	3.75	-2.55	4.36	-0.76	2.99	+2.50	1.31	+0.64	1.47	+2.10
2.40	+0.88	3.73	-3.38	5.55	+1.13	2.16	+1.58	2.35	+2.00	0.53	+0.16	0.41	+0.07
2.98	+0.78	2.06	-1.54	2.76	-0.01	5.74	+0.10	1.62	+4.63	0.77	+0.05	0.70	+0.57
0.11	+0.00	3.29	-2.83	2.54	+1.44	1.36	+2.32	1.58	+3.57	0.50	-0.28	0.80	+1.27
1.02	+1.33	4.80	-4.16	5.00	+0.59	1.77	-0.27	1.88	+0.14	0.07	-0.15	2.26	+3.26
0.81	+0.89	3.68	-3.01	3.55	-1.14	1.28	-0.30	1.04	+2.02	0.54	-0.01	1.84	+4.00
0.13	+0.02	0.94	-0.87	1.12	+0.72	0.81	-0.69	0.27	+0.85	0.48	-0.24	1.29	+1.45
0.17	+0.15	2.13	-0.80	3.28	-1.71	1.25	+0.26	0.60	+0.82	0.50	-0.34	2.04	+3.54
0.40	+0.09	2.24	-1.87	3.58	-2.34	0.86	-0.03	0.89	+0.60	0.55	+0.00	2.28	+3.20
0.47	+0.05	1.63	-1.27	2.40	-0.36	0.66	+0.25	0.36	+0.33	0.31	+0.22	1.67	+3.49
0.81	-0.08	1.90	-1.71	3.30	-2.08	1.27	-0.59	0.56	+0.28	0.46	-0.43	1.93	+2.73
0.02	+0.04	0.88	-0.60	1.97	-0.95	0.75	-0.52	0.18	+0.15	0.42	-0.39	1.65	+3.42
0.01	-0.01	0.20	-0.19	0.26	+0.06	0.06	-0.08	0.04	-0.04	0.03	-0.03	0.49	+1.47

*Normal precipitation and departure (of 1884)*

Stations.	Established.	January.		February.		March.		April.		May.	
		Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -
Middle Plateau:		<i>In.</i>	<i>Inch.</i>	<i>In.</i>	<i>Inch.</i>	<i>In.</i>	<i>Inch.</i>	<i>In.</i>	<i>Inch.</i>	<i>In.</i>	<i>Inch.</i>
Salt Lake City, Utah .....	Mar. 12, 1874	1.33	-0.62	1.37	+0.86	2.01	+1.68	2.44	+0.45	2.14	-0.36
Northern Plateau:											
Boisé City, Idaho .....	July 1, 1877	2.43	-0.68	1.76	-0.44	1.49	+1.29	1.19	-0.41	1.02	-0.10
Conrad Aleno, Fort, Idaho.	Sept. 1, 1881	2.86	+0.16	1.77	-0.43	0.76	+0.09	1.95	-0.50	1.78	-1.12
Lewiston, Idaho .....	July 1, 1879	2.89	-0.24	1.83	+1.25	1.18	+0.07	1.81	+0.14	1.00	-0.50
Dayton, Wash .....	July 1, 1879	3.92	-0.72	4.04	+1.62	1.99	-0.20	3.09	-0.60	1.77	-0.96
Spokane Falls, Wash .....	Feb. 5, 1881	3.82	-1.03	3.02	+0.02	1.10	-0.44	1.82	-0.49	1.18	-0.62
North Pacific Coast:											
Olympia, Wash .....	July 1, 1877	8.80	-3.33	9.74	-5.57	5.53	-3.96	4.24	-0.64	2.58	-1.12
Portland, Oreg .....	Nov. 1, 1871	7.06	-3.86	7.86	-2.98	6.88	-4.63	3.49	+0.08	2.85	-1.01
Roseburg, Oreg .....	July 15, 1877	6.47	-2.81	4.75	-1.04	3.95	-0.58	3.00	+0.48	1.77	-0.92
Middle Pacific Coast:											
Cape Mendocino, Cal .....	July 27, 1882	2.09	-0.82	2.40	+0.45	2.60	+0.92	3.13	+0.23	1.00	-0.67
Red Bluff, Cal .....	July 1, 1877	6.08	-2.68	4.47	-2.26	3.55	+4.26	3.09	+1.22	1.20	-1.02
Sacramento, Cal .....	July 1, 1877	3.97	-0.64	3.83	+0.63	3.81	+4.33	3.73	+0.54	0.78	-0.72
San Francisco, Cal .....	Mar. 8, 1871	5.01	-1.07	4.16	+2.49	3.26	+4.98	2.12	+4.21	0.68	-0.45
South Pacific Coast:											
Los Angeles, Cal .....	July 1, 1877	2.21	+0.94	4.30	+0.07	3.44	+8.92	2.00	+1.58	0.57	-0.18
San Diego, Cal .....	Nov. 1, 1871	1.81	-0.47	2.61	+6.44	1.38	+4.85	0.84	+2.00	0.41	+1.76
Alaska Stations:											
Alexander, Fort, Alaska ..	Aug. 1, 1881	5.84	( <sup>a</sup> )	1.33	( <sup>a</sup> )	3.46	( <sup>a</sup> )	0.98	( <sup>a</sup> )	2.11	( <sup>a</sup> )
Atka, Alaska .....	Oct. —, 1882	9.04	-1.01	7.31	+3.00	6.38	+0.76	5.41	+0.56	5.90	+0.56
Pyramid Harbor, Alaska ..	Oct. —, 1881	4.45	-1.15	8.12	-3.22	4.01	+1.74	1.72	-0.74	1.78	+1.16
Saint Michael's, Ft., Alaska	June 26, 1874	0.90	-0.89	0.15	+0.02	0.37	+0.41	0.51	-0.25	0.91	-0.66
Sitka, Alaska .....	Mar. 30, 1881	10.97	+3.04	9.81	-3.66	10.19	+0.86	3.99	-1.23	5.01	+5.34
Unalashka, Alaska .....	Aug. 18, 1878	10.20	+1.73	8.34	17.85	6.44	+3.00	5.21	+8.79	5.44	-1.47
Behring's Island, Behring Sea .....	May 22, 1882	0.78	+0.16	2.24	-0.75	1.02	+0.42	1.20	+0.18	0.84	+0.47

<sup>a</sup>No record.



therefrom at stations of the Signal Service, &amp;c.—Continued.

June.		July.		August.		September.		October.		November.		December.	
Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -
Inch.	Inches.	Inch.	Inches.	Inch.	Inches.	Inch.	Inches.	Inch.	Inches.	Inch.	Inches.	Inch.	Inches.
0.67	-0.34	0.59	-0.32	0.84	-0.11	0.85	+1.06	1.81	-1.45	1.47	-0.97	1.48	+0.04
0.94	+2.47	0.20	+0.40	0.00	-0.02	0.59	+1.52	1.63	-0.11	0.73	-0.61	2.35	+3.32
0.70	+0.88	0.56	+1.11	0.08	+0.09	0.04	+0.62	2.09	+0.73	2.38	-1.09	2.57	+0.65
1.88	+2.78	0.87	+0.43	0.30	-0.24	0.62	+0.39	1.96	+0.12	1.40	-1.04	3.28	-0.49
1.10	+0.92	0.70	-0.38	0.41	-0.32	0.82	+0.58	2.89	+0.65	2.09	-1.84	4.98	+0.12
1.40	-1.18	1.05	+0.01	0.32	+0.22	1.46	+0.97	2.63	-0.81	1.81	-1.22	2.37	+0.91
1.21	+1.09	0.88	-3.28	0.85	+0.11	2.99	+0.07	5.44	-1.14	7.31	-5.94	9.62	-3.80
1.79	-0.37	0.79	+1.01	0.77	-0.44	1.82	+2.43	4.88	-0.87	7.08	-3.84	8.22	-6.70
1.01	+0.89	0.47	-0.42	0.44	( <sup>1</sup> )	1.00	( <sup>1</sup> )	2.91	-1.76	8.40	-2.61	6.31	-2.89
0.47	+0.45	0.22	+0.23	0.11	+0.22	0.93	+0.25	1.74	-1.22	1.39	-0.99	2.42	+0.16
0.28	+0.69	0.01	-0.01	0.04	-0.04	0.42	-0.06	1.43	-0.53	2.20	-2.16	5.36	+2.37
0.31	+1.14	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	±0.00	0.33	+0.27	1.04	+0.97	1.17	-1.17	4.05	+6.40
0.33	+2.24	0.01	-0.01	0.01	+0.03	0.16	+0.17	1.23	+1.32	2.52	-2.26	4.93	+2.75
0.22	+1.17	( <sup>2</sup> )	+0.02	( <sup>2</sup> )	+0.02	( <sup>2</sup> )	±0.00	0.59	-0.20	0.96	+0.11	3.92	+0.73
0.07	+0.24	0.02	-0.02	0.21	-0.21	0.05	+0.02	0.48	-0.13	0.66	-0.55	2.83	+2.79
1.71	( <sup>1</sup> )	4.48	+1.62	2.98	-0.79	5.28	+1.43	1.94	-1.61	3.65	-2.61	1.32	-0.89
3.86	+1.24	6.10	+5.52	5.51	-1.73	9.02	-0.82	10.32	+2.42	11.59	+0.26	7.80	+1.54
2.03	-0.98	1.98	+0.21	2.22	-0.70	5.18	-2.74	5.02	-3.84	7.07	+0.10	6.33	-1.10
1.12	-0.35	1.64	+2.36	2.43	-1.08	2.86	+2.18	1.32	+0.14	0.82	-0.22	0.66	-0.46
3.29	+0.48	5.56	-0.78	6.10	+0.84	10.76	+2.42	10.64	+3.92	12.98	+3.33	11.43	+4.34
4.82	+7.59	2.51	+1.80	3.41	+1.49	8.84	+2.59	11.04	+0.81	9.40	+10.49	12.48	+15.74
1.67	-1.41	1.94	+0.33	2.07	-0.36	2.23	-0.53	3.02	+0.24	2.59	+0.80	1.63	-0.67

<sup>1</sup> Record incomplete<sup>2</sup> Inappreciable.

## APPENDIX 28.

*Average precipitation at selected stations of the Signal Service, United States Army, for each month and the year. (Computed for the decade ending December 31, 1884.)*

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
<b>New England:</b>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
Eastport, Me. ....	3.33	4.43	5.53	3.06	4.70	3.98	5.38	3.16	3.57	4.56	4.72	4.23	51.23
Portland, Me. ....	4.39	3.85	3.84	3.08	3.19	3.58	3.69	2.65	2.97	3.23	3.53	3.57	40.64
Mount Washington, N. H. ....	4.43	4.00	7.44	6.80	7.83	8.81	11.66	7.74	9.21	7.91	7.74	6.44	90.13
Boston, Mass. ....	4.37	3.97	5.55	4.00	3.21	3.64	4.04	3.46	3.05	4.10	5.04	3.50	48.02
New Haven, Conn. ....	3.90	4.47	5.70	3.71	3.30	3.48	5.29	4.46	3.08	3.68	3.96	3.66	49.70
New London, Conn. ....	4.47	4.19	5.56	3.60	3.18	3.95	5.03	4.27	3.45	3.97	3.75	3.53	49.07
<b>Middle Atlantic States:</b>													
Albany, N. Y. ....	2.65	2.84	3.04	2.58	3.02	4.02	4.30	3.49	3.43	3.21	2.61	2.95	38.15
New York City. ....	3.33	3.76	4.47	2.90	2.68	3.31	4.37	4.63	3.50	2.93	3.24	3.75	43.48
Philadelphia, Pa. ....	3.30	3.40	3.60	2.36	2.50	3.34	3.85	3.04	3.47	2.33	2.96	2.32	38.40
Atlantic City, N. J. ....	4.05	3.53	4.37	3.43	2.32	3.38	3.31	5.51	3.31	2.92	3.56	4.47	44.16
Barnegat City, N. J. ....	4.95	3.78	5.27	2.90	2.53	3.65	4.11	5.10	4.63	3.58	4.27	4.03	49.60
Cape May, N. J. ....	4.29	3.49	5.56	3.08	2.49	3.87	3.38	6.54	3.88	3.40	4.60	4.77	48.34
Sandy Hook, N. J. ....	4.23	3.73	5.63	3.75	4.14	4.50	4.63	4.98	4.04	3.51	4.17	4.15	51.53
Baltimore, Md. ....	3.55	3.44	4.70	3.04	2.81	4.47	4.73	3.88	4.07	2.64	2.97	3.09	44.07
Washington City. ....	3.86	3.44	4.56	2.97	2.90	4.92	4.69	4.97	3.97	2.85	2.90	3.77	45.81
Cape Henry, Va. ....	5.22	3.21	6.30	5.32	3.06	3.85	6.90	5.28	4.43	4.31	4.12	4.42	56.82
Lynchburg, Va. ....	4.21	3.31	4.40	3.13	2.35	3.32	2.94	3.90	3.81	3.06	3.42	4.74	42.59
Norfolk, Va. ....	4.46	2.98	4.68	4.34	3.13	4.31	5.42	5.84	5.07	3.48	3.09	3.59	50.33
<b>South Atlantic States:</b>													
Hatteras, N. C. ....	6.50	5.25	7.84	5.78	3.89	4.78	6.64	6.24	7.34	7.06	6.51	6.76	74.54
Wilmington, N. C. ....	4.02	2.79	4.40	3.78	3.33	7.14	7.02	3.18	7.41	4.06	2.66	3.58	58.78
Charleston, S. C. ....	4.22	3.92	4.15	5.65	3.87	6.11	7.70	6.03	6.55	5.23	3.24	3.66	59.37
Augusta, Ga. ....	4.74	3.32	5.49	4.81	2.24	4.38	4.16	4.54	3.98	2.30	3.90	4.08	47.94
Savannah, Ga. ....	3.93	2.96	3.42	5.28	2.30	7.07	4.42	6.49	5.05	4.19	2.33	3.78	50.64
Jacksonville, Fla. ....	3.59	3.32	2.54	4.03	3.88	5.02	5.00	7.20	6.99	7.42	3.26	3.02	55.29
<b>Florida Peninsula:</b>													
Key West, Fla. ....	2.31	1.61	0.75	1.58	4.51	4.41	3.72	5.78	6.93	6.96	2.63	1.59	42.97
<b>Eastern Gulf States:</b>													
Montgomery, Ala. ....	4.63	4.96	6.01	6.25	3.22	4.20	3.68	3.65	2.98	3.05	3.84	3.55	53.31
Vicksburg, Miss. ....	5.81	5.90	7.04	5.81	5.17	3.79	4.15	4.04	4.75	4.13	4.62	6.30	63.21
New Orleans, La. ....	5.76	4.79	5.67	6.62	5.02	5.68	6.34	5.46	4.41	3.58	5.40	6.01	64.74
<b>Western Gulf States:</b>													
Shreveport, La. ....	4.98	4.47	4.92	5.83	5.21	2.96	4.07	4.40	4.33	4.05	4.43	5.56	54.53
Galveston, Tex. ....	4.12	3.81	3.21	3.37	4.53	3.40	3.13	5.27	6.53	5.84	4.86	5.23	52.98
Indianola, Tex. ....	2.05	1.80	2.46	1.79	3.54	2.39	2.06	4.46	4.49	4.69	3.26	2.69	37.68
<b>Ohio Valley and Tennessee:</b>													
Knoxville, Tenn. ....	6.90	4.98	6.44	5.18	3.06	4.10	5.11	3.87	2.74	3.22	4.20	4.57	54.89
Memphis, Tenn. ....	6.58	5.30	6.13	6.58	5.25	5.63	3.17	3.17	2.61	3.33	5.13	4.56	53.50
Nashville, Tenn. ....	5.90	5.41	5.89	5.37	3.52	4.96	5.61	3.80	3.69	3.25	3.99	4.14	54.74
Louisville, Ky. ....	4.34	4.77	4.56	4.13	3.95	4.53	4.71	3.75	3.01	3.68	3.91	4.56	49.90
Indianapolis, Ind. ....	2.69	4.06	4.29	3.28	4.74	3.16	5.04	3.29	2.92	3.91	4.68	3.62	43.02
Cincinnati, Ohio ....	3.99	4.36	4.35	3.14	4.11	5.54	4.08	4.23	4.27	3.25	3.23	4.06	43.87
Pittsburg, Pa. ....	3.20	2.74	3.41	2.16	2.90	3.86	4.56	2.92	3.00	2.26	2.62	3.10	36.74
<b>Lower Lakes:</b>													
Buffalo, N. Y. ....	2.75	2.76	3.05	2.25	3.23	3.33	4.45	2.91	3.12	3.88	3.48	3.78	38.61
Oswego, N. Y. ....	3.37	3.11	3.27	1.84	3.14	3.33	2.98	2.49	2.57	3.26	3.73	4.41	37.45
Erie, Pa. ....	3.23	3.30	3.40	2.62	3.72	4.15	2.94	2.94	4.36	4.23	3.75	4.48	43.15
Cleveland, Ohio. ....	2.42	3.12	3.28	2.28	3.40	4.37	4.17	2.95	4.33	3.29	2.81	2.91	39.33
Toledo, Ohio. ....	1.92	2.07	2.35	1.93	3.47	3.31	3.81	3.04	2.73	3.25	2.94	2.47	33.80
Detroit, Mich. ....	1.93	2.91	3.21	2.21	3.74	3.68	4.60	3.37	2.38	3.86	2.90	2.37	37.61
<b>Upper Lakes:</b>													
Alpena, Mich. ....	2.17	2.46	3.10	1.80	4.02	4.34	3.72	3.76	4.69	5.04	3.14	2.70	39.95
Escanaba, Mich. ....	1.45	1.61	1.85	2.16	3.70	5.06	3.10	4.72	4.69	4.66	2.65	2.04	37.60
Marquette, Mich. ....	1.32	1.72	1.56	1.08	2.96	4.46	3.10	3.36	5.25	4.10	2.68	2.69	35.15
Port Huron, Mich. ....	1.92	2.40	3.86	2.25	3.10	3.88	2.94	3.08	2.54	3.44	2.70	2.59	34.65
Chicago, Ill. ....	1.70	2.87	3.18	3.48	3.76	4.62	4.50	2.78	2.45	4.43	1.82	2.24	39.13
Milwaukee, Wis. ....	1.92	2.47	3.20	1.18	3.66	4.88	3.72	2.76	2.73	3.13	1.18	2.22	34.38
Duluth, Minn. ....	0.95	1.28	1.70	2.37	4.47	4.67	3.72	3.68	4.52	3.40	1.76	1.61	33.96
<b>Upper Mississippi Valley:</b>													
Saint Paul, Minn. ....	1.07	1.19	1.54	1.99	3.48	4.05	3.33	3.58	3.06	2.30	1.26	1.45	23.33
La Crosse, Wis. ....	1.18	1.32	1.96	2.12	3.54	4.52	3.54	3.87	3.24	2.92	2.00	1.49	35.71
Davenport, Iowa. ....	1.37	1.88	2.61	2.83	4.37	5.49	4.35	3.25	3.16	3.70	2.12	1.71	36.83
Dubuque, Iowa. ....	1.33	1.70	2.56	3.04	4.31	5.88	5.00	3.40	4.95	3.42	2.24	1.89	40.62
Keokuk, Iowa. ....	1.34	2.10	2.64	2.84	4.57	6.06	4.63	3.20	3.65	3.76	2.21	1.97	38.96
Cairo, Ill. ....	4.56	4.30	4.25	3.85	4.40	5.04	4.23	3.13	2.39	3.46	4.24	3.84	48.27
Saint Louis, Mo. ....	1.94	3.56	3.33	3.42	3.48	5.17	4.18	3.59	3.02	3.16	3.07	2.52	39.43

*Average precipitation at selected stations of the Signal Service, &c.—Continued.*

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
<b>Missouri Valley:</b>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
Leavenworth, Kans .....	1.09	1.72	2.57	3.60	5.06	6.09	5.13	3.07	3.11	3.78	2.64	1.54	33.40
Omaha, Nebr.....	0.62	0.88	1.84	3.39	5.52	7.49	6.22	4.13	3.54	3.42	1.22	0.95	39.22
Yankton, Dak.....	0.58	0.90	1.24	3.50	4.54	5.01	4.43	2.43	2.99	1.85	0.38	0.80	23.64
<b>Extreme Northwest:</b>													
Bismarck, Dak.....	0.56	0.68	1.15	2.86	3.23	3.64	2.35	2.82	1.44	1.34	0.56	0.85	21.48
<b>Northern Slope:</b>													
Cheyenne, Wyo .....	0.84	0.15	0.62	1.07	2.45	1.27	1.58	1.56	0.94	0.74	0.26	0.26	11.25
North Platte, Nebr.....	0.60	0.39	0.64	1.84	3.09	3.72	2.96	2.29	1.40	1.32	0.29	0.79	19.82
<b>Middle Slope:</b>													
Denver, Colo .....	0.70	0.50	0.88	1.76	3.43	1.52	1.53	1.64	0.78	0.76	0.81	0.84	15.15
Pike's Peak, Colo .....	1.64	1.29	2.06	3.14	4.11	1.96	4.38	4.20	1.90	1.46	2.26	1.44	30.84
Dodge City, Kans.....	0.26	0.55	0.82	1.24	4.35	3.06	3.40	3.45	1.07	1.45	0.70	0.78	21.11
<b>Middle Plateau:</b>													
Salt Lake City, Utah .....	1.32	1.37	2.08	2.60	2.07	0.67	0.41	0.76	0.81	1.81	1.40	1.55	16.97
<b>North Pacific Coast:</b>													
Portland, Oreg .....	6.78	7.92	6.63	3.64	2.51	1.61	0.89	0.83	2.07	5.74	7.71	8.76	55.04
<b>Middle Pacific Coast:</b>													
San Francisco, Cal .....	5.88	4.10	3.89	2.57	0.84	0.44	( <sup>1</sup> )	0.01	0.22	1.36	2.20	3.86	24.89
<b>South Pacific Coast:</b>													
San Diego, Cal .....	1.90	2.34	1.62	1.02	0.48	0.09	0.01	0.06	0.05	0.57	0.62	2.28	11.14

<sup>1</sup> Inappreciable.

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## APPENDIX 29.

*Average precipitation at selected stations of the Signal Service, United States Army, for each month and the year. (Computed from January, 1880, to and including December, 1884.)*

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
<b>New England:</b>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
Eastport, Me.	3.44	5.21	5.15	3.35	4.09	4.01	5.91	2.29	3.25	4.52	3.92	5.13	52.06
Portland, Me.	4.22	4.82	3.88	2.70	4.06	2.91	4.18	1.75	3.35	3.15	2.64	4.32	41.50
Mount Washington, N. H.	4.40	5.68	7.25	5.87	9.11	8.78	12.45	7.08	0.83	10.20	7.80	6.75	95.19
Boston, Mass.	4.80	4.45	4.78	2.92	4.05	3.18	4.14	2.20	3.52	3.57	2.47	3.61	43.68
New Haven, Conn.	4.54	5.01	5.10	2.81	3.60	3.24	4.60	3.55	4.49	3.75	2.42	4.30	46.91
New London, Conn.	5.32	5.48	5.10	3.33	4.35	4.07	5.04	4.12	3.60	4.51	2.99	4.11	52.21
<b>Middle Atlantic States:</b>													
Albany, N. Y.	2.77	3.07	2.71	2.02	3.48	3.61	4.19	3.05	3.60	2.41	2.80	2.98	36.18
New York City	4.61	4.24	3.96	2.56	2.95	3.78	4.05	3.69	4.37	2.90	2.43	4.16	43.70
Philadelphia, Pa.	3.87	4.48	3.53	1.85	2.72	3.27	3.14	4.07	3.71	2.37	1.68	2.94	37.58
Atlantic City, N. J.	5.04	4.97	4.00	3.30	2.18	3.16	3.38	5.87	3.37	3.81	2.62	4.79	47.99
Barnegat City, N. J.	5.58	4.94	4.84	2.74	2.53	3.89	3.57	5.41	5.45	4.25	2.81	4.55	50.49
Cape May, N. J.	5.28	4.85	5.61	2.50	2.31	3.63	3.22	5.67	3.22	4.20	3.52	5.17	48.67
Sandy Hook, N. J.	4.68	4.17	4.51	3.25	4.50	4.33	3.99	3.28	4.61	3.81	2.78	3.69	47.55
Baltimore, Md.	4.09	4.55	5.18	2.61	2.27	5.24	4.88	3.23	3.54	2.36	2.08	3.88	43.91
Washington City	4.70	4.55	5.29	2.88	3.16	5.41	4.10	2.73	3.58	2.10	2.17	4.02	44.70
Cape Henry, Va.	5.64	3.54	6.23	5.10	2.14	4.08	6.09	4.43	3.19	4.59	2.40	4.03	53.80
Lynchburg, Va.	5.01	4.14	4.97	3.15	2.29	3.62	3.25	2.74	3.86	2.44	2.49	5.72	43.68
Norfolk, Va.	4.84	3.31	4.84	4.17	2.65	5.03	6.08	4.41	3.32	3.29	2.97	3.92	49.78
<b>South Atlantic States:</b>													
Charlotte, N. C.	6.59	4.96	6.39	5.33	2.57	4.52	5.19	4.08	3.77	3.52	4.30	4.99	56.06
Hatteras, N. C.	7.21	5.30	7.44	4.70	3.53	4.70	7.94	6.67	5.33	6.48	7.85	5.22	72.28
Kitty Hawk, N. C.	6.37	3.91	6.69	5.67	2.63	4.58	9.01	8.29	4.26	3.92	5.56	6.05	65.95
Smithville, N. C.	4.71	2.75	4.69	3.54	1.96	2.92	5.98	5.45	3.66	4.06	2.74	3.18	46.34
Wilmington, N. C.	4.42	2.69	5.20	3.34	2.77	6.43	8.70	7.83	3.78	3.21	2.68	3.62	56.38
Charleston, S. C.	3.95	2.37	4.26	3.33	2.80	4.78	6.91	7.16	5.92	3.80	2.75	3.65	51.69
Augusta, Ga.	5.54	3.35	6.18	5.03	2.74	3.59	3.75	4.23	3.35	1.93	3.68	4.06	47.46
Savannah, Ga.	4.29	2.18	3.47	3.69	2.28	5.29	4.05	7.80	4.45	3.53	2.16	4.29	46.90
Jacksonville, Fla.	4.88	2.26	2.89	3.62	3.93	4.98	6.44	7.54	5.49	3.16	4.14	2.59	56.36
<b>Florida Peninsula:</b>													
Cedar Keys, Fla.	5.26	2.70	3.31	2.98	2.57	6.15	8.48	9.47	5.52	3.35	3.37	3.56	56.70
Key West, Fla.	2.16	0.72	0.49	2.15	5.05	4.12	3.78	3.68	6.54	6.51	3.23	1.45	41.03
<b>Eastern Gulf States:</b>													
Atlanta, Ga.	7.72	6.57	8.09	6.19	2.43	4.46	2.76	3.97	2.99	1.96	4.86	5.71	57.42
Pensacola, Fla.	5.08	4.43	4.37	5.00	4.97	5.63	6.42	10.48	6.73	4.28	5.10	6.00	68.56
Montgomery, Ala.	4.86	5.35	6.95	5.44	3.04	4.64	3.06	3.60	2.40	2.33	2.98	5.51	50.22
Vicksburg, Miss.	6.98	6.43	6.73	8.49	6.52	3.36	5.38	3.33	4.81	5.02	7.72	7.01	68.63
New Orleans, La.	6.34	3.84	4.72	7.26	5.26	6.53	6.50	4.65	3.36	3.58	4.95	5.76	62.78
<b>Western Gulf States:</b>													
Shreveport, La.	4.62	6.33	4.85	5.55	6.46	2.74	5.16	1.67	4.40	3.85	5.28	0.03	58.92
Little Rock, Ark.	4.76	3.69	5.03	6.28	7.07	3.28	3.90	2.14	3.71	3.94	4.09	5.50	60.35
Galveston, Tex.	4.86	3.61	3.87	2.82	5.15	4.48	2.89	4.06	5.76	0.70	4.01	4.36	53.14
Indianola, Tex.	2.56	1.53	2.46	1.81	4.76	2.91	1.90	4.87	8.06	4.12	3.28	1.65	39.93
<b>Rio Grande Valley:</b>													
Brownsville, Tex.	2.37	0.90	1.00	0.58	3.75	2.22	3.02	4.98	5.26	6.62	3.45	1.76	34.86
<b>Ohio Valley and Tennessee:</b>													
Chattanooga, Tenn.	7.82	5.67	7.74	6.41	2.96	4.81	3.32	4.15	3.96	3.05	4.99	5.50	61.40
Knoxville, Tenn.	7.63	5.34	6.56	5.14	3.18	4.08	5.75	2.90	2.66	3.06	4.06	2.20	55.55
Memphis, Tenn.	6.62	8.70	6.13	5.29	5.75	4.82	2.26	2.32	7.77	4.78	5.86	4.36	59.48
Nashville, Tenn.	6.56	6.51	6.64	5.82	4.72	4.11	3.78	3.57	3.63	4.17	3.79	3.69	58.22
Louisville, Ky.	3.92	7.64	4.09	4.50	4.85	3.74	3.52	2.32	2.99	4.29	3.44	4.80	49.98
Indianapolis, Ind.	2.91	5.76	4.08	3.67	5.69	6.09	3.73	2.22	2.33	4.54	4.54	3.85	49.50
Cincinnati, Ohio	3.99	6.72	3.99	3.70	5.49	5.68	2.49	2.93	2.47	4.06	3.23	4.38	49.13
Columbus, Ohio	3.38	4.64	3.60	3.89	4.99	4.08	3.74	3.08	4.43	4.24	3.36	3.69	44.57
Pittsburg, Pa.	3.84	3.74	3.22	2.08	3.65	4.21	3.51	3.07	3.32	2.55	1.83	3.16	37.18
<b>Lower Lakes:</b>													
Buffalo, N. Y.	2.47	3.23	2.48	1.88	4.50	3.67	3.03	3.16	2.05	3.68	3.06	3.62	38.83
Oswego, N. Y.	3.87	3.72	3.44	1.56	4.14	3.21	1.94	2.98	1.79	2.92	3.42	4.52	36.91
Erie, Pa.	2.34	4.12	2.81	2.67	4.10	3.94	3.50	2.76	3.91	3.94	4.84	3.70	43.04
Cleveland, Ohio	2.04	4.11	2.44	2.35	3.85	4.76	3.96	2.33	3.43	3.02	2.87	3.66	37.34
Toledo, Ohio	1.91	3.00	1.99	2.31	3.92	4.06	4.58	2.45	2.49	3.93	2.72	2.13	35.47
Detroit, Mich.	2.19	3.29	2.63	2.55	3.92	4.04	3.59	2.74	2.62	3.78	2.60	2.53	36.84

*Average precipitation at selected stations of the Signal Service, &c.—Continued.*

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
<b>Upper Lakes:</b>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
Alpena, Mich.....	2.68	2.85	2.45	1.89	2.94	5.30	3.59	3.06	3.85	4.49	3.08	2.87	41.04
Escanaba, Mich.....	1.95	1.89	1.44	1.58	3.96	5.03	2.99	4.14	5.62	4.72	2.81	2.26	38.40
Grand Haven, Mich.....	2.75	3.66	3.19	3.17	3.81	5.24	4.99	3.06	3.54	5.12	3.23	3.44	45.28
Marquette, Mich.....	1.80	2.15	1.79	2.32	3.45	3.49	3.09	3.56	5.92	3.98	2.43	3.09	37.07
Port Huron, Mich.....	2.36	3.17	3.26	2.46	3.58	4.59	3.17	3.07	2.00	3.66	2.58	2.88	36.28
Chicago, Ill.....	1.82	3.82	2.83	4.11	4.24	4.57	4.01	2.74	2.23	4.87	3.08	2.29	40.63
Milwaukee, Wis.....	1.69	2.89	2.68	2.19	3.01	4.81	4.21	2.15	2.52	2.70	1.56	1.60	31.50
Duluth, Minn.....	1.04	1.77	1.73	2.32	4.09	4.98	2.93	4.62	4.82	3.86	1.94	1.43	34.55
<b>Upper Mississippi Valley:</b>													
Saint Paul, Minn.....	1.39	1.54	1.60	2.12	2.72	4.34	3.09	2.95	3.73	2.43	1.51	1.55	28.97
La Crosse, Wis.....	1.14	1.19	1.50	2.15	3.13	4.20	6.13	3.44	6.07	3.83	1.64	1.08	35.20
Davenport, Iowa.....	1.48	2.38	2.58	2.57	4.23	6.21	3.56	2.78	3.47	4.77	2.00	1.86	37.86
Des Moines, Iowa.....	1.09	1.70	1.51	2.97	6.46	8.73	4.74	4.86	3.51	5.41	2.27	1.64	44.88
Dubuque, Iowa.....	1.45	2.63	2.40	2.80	4.42	6.02	5.75	3.77	5.17	4.25	1.99	2.11	42.15
Keokuk, Iowa.....	1.51	2.81	2.40	3.08	4.48	6.22	3.06	2.36	2.97	4.61	1.94	1.86	37.52
Chicago, Ill.....	3.91	6.84	3.28	4.06	5.14	3.43	5.01	2.13	3.19	4.23	3.44	3.95	48.50
Springfield, Ill.....	1.90	5.69	3.86	3.19	5.92	6.95	2.89	2.22	3.74	4.83	3.18	2.48	47.52
Saint Louis, Mo.....	1.77	5.21	2.65	3.50	3.50	3.86	3.66	1.29	2.80	4.16	3.78	2.59	39.16
<b>Missouri Valley:</b>													
Leavenworth, Kans.....	1.00	2.35	2.07	2.62	4.66	5.24	5.01	3.45	3.51	4.80	2.23	0.97	37.89
Omaha, Nebr.....	0.80	1.27	1.49	3.23	5.80	7.91	6.63	4.68	4.24	4.46	1.00	0.84	41.71
Yankton, Dak.....	0.64	1.10	1.03	3.45	5.87	3.90	3.49	2.18	2.78	2.07	0.30	0.72	28.13
<b>Extreme Northwest:</b>													
Bismarck, Dak.....	0.87	0.55	0.67	2.40	2.44	3.56	2.51	2.58	1.22	1.40	0.53	0.94	19.17
Binford, Fort, Dak.....	0.89	0.48	0.62	0.96	1.47	2.55	2.26	1.33	1.05	0.83	0.36	0.84	13.61
<b>Northern Slope:</b>													
Custer, Fort, Mont.....	1.33	0.50	0.53	1.17	3.21	2.51	1.21	1.16	0.89	0.78	0.56	0.90	14.80
Deadwood, Dak.....	1.12	0.99	1.62	3.78	5.05	3.98	2.64	2.05	0.90	1.00	1.29	1.21	25.63
Cheyenne, Wyo.....	0.47	0.17	0.58	1.41	2.56	1.86	1.53	1.74	1.06	0.62	0.21	0.33	12.74
North Platte, Nebr.....	0.39	0.51	0.75	1.64	3.51	4.59	2.44	2.61	1.07	2.08	0.21	0.58	20.38
<b>Middle Slope:</b>													
Denver, Colo.....	0.80	0.61	0.48	1.74	3.04	1.72	1.49	1.49	0.55	0.83	0.78	0.78	14.28
Pike's Peak, Colo.....	1.85	1.28	2.18	2.12	4.78	1.49	4.23	4.26	1.67	1.61	1.85	0.98	28.30
Dodge City, Kans.....	0.24	0.71	0.63	1.33	5.92	3.87	4.22	3.82	1.03	2.01	0.89	0.58	24.73
Elliott, Fort, Tex.....	0.28	0.35	0.26	0.80	5.62	2.93	3.04	3.18	2.54	3.25	0.78	0.98	23.97
<b>Southern Slope:</b>													
Concho, Fort, Tex.....	1.50	1.47	1.5	1.70	6.05	2.06	4.49	4.21	4.35	4.38	1.40	1.62	34.73
Stockton, Fort, Tex.....	0.45	0.55	0.45	0.48	1.60	2.08	2.91	3.73	8.47	2.24	1.05	0.80	24.61
<b>Southern Plateau:</b>													
El Paso, Tex.....	0.53	0.45	0.62	0.27	0.39	0.12	3.86	2.98	1.77	1.82	0.56	1.04	14.41
Apache, Fort, Ariz.....	1.17	2.17	2.16	0.96	0.69	1.22	4.87	5.39	1.82	1.73	0.81	2.43	24.06
Grant, Fort, Ariz.....	0.77	1.62	1.74	0.30	0.61	1.05	3.85	3.88	1.41	1.35	0.30	1.95	18.13
Prescott, Ariz.....	0.72	1.90	2.17	0.79	0.50	0.18	2.86	3.24	1.37	0.55	0.49	2.46	16.73
<b>Middle Plateau:</b>													
Salt Lake City, Utah.....	1.04	1.37	1.57	2.87	1.48	0.64	0.22	1.06	0.68	1.62	1.09	1.48	15.11
<b>Northern Plateau:</b>													
Lewiston, Idaho.....	2.39	1.85	1.18	1.31	1.00	1.88	0.87	0.30	0.62	1.96	1.40	3.28	18.05
Dayton, Wash.....	3.92	4.04	1.99	3.09	1.77	1.10	0.70	0.41	0.82	2.80	2.09	5.06	27.77
<b>North Pacific Coast:</b>													
Olympia, Wash.....	0.17	7.68	3.28	5.27	2.39	1.56	0.55	0.54	2.01	5.20	4.41	9.36	51.42
Portland, Oreg.....	8.66	7.35	3.70	4.50	1.87	1.47	0.90	0.80	1.96	5.52	5.74	10.91	53.40
<b>Middle Pacific Coast:</b>													
Red Bluff, Cal.....	3.73	2.20	3.06	3.45	1.06	0.38	(1)	(1)	0.59	1.61	1.34	5.65	23.02
Sacramento, Cal.....	3.07	2.97	3.74	4.56	0.80	0.41	(1)	(1)	0.47	1.23	1.15	5.42	23.83
San Francisco, Cal.....	3.69	3.43	3.54	4.22	1.06	0.66	(1)	0.01	0.25	1.46	1.66	5.36	25.84
<b>South Pacific Coast:</b>													
Los Angeles, Cal.....	1.71	4.28	4.20	2.22	0.62	0.28	(1)	(1)	(1)	0.56	0.77	3.24	17.89
San Diego, Cal.....	1.62	2.90	2.19	1.26	0.72	0.11	0.02	0.07	0.02	0.71	0.22	2.30	12.14

1 Inappreciable.

## APPENDIX 30.

Annual and mean annual precipitation, at stations of the Signal Service, United States Army, compiled from the commencement of observations to 1884, inclusive.

Stations.	Established.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	Mean annual.	
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Years.	Inches.
New England :																	
Eastport, Me.	Apr. 1, 1873	.....	.....	.....	42.56	45.43	57.99	60.62	61.87	43.48	42.44	55.98	47.18	53.17	64.83	11	50.43
Portland, Me.	Jan. 15, 1871	.....	37.03	38.90	35.24	38.14	39.04	43.51	38.60	41.61	37.69	46.98	37.74	81.99	52.51	13	39.74
Mount Washington, N. H.	Dec. 1, 1870	.....	54.51	78.54	70.72	55.78	77.58	86.41	114.49	91.11	79.93	121.13	97.41	78.71	100.78	13	88.16
Boston, Mass.	Nov. 1, 1870	.....	50.62	54.53	43.62	50.15	48.98	51.49	65.53	45.67	37.30	52.63	43.82	35.48	49.18	14	48.28
Block Island, R. I.	Sept. 1, 1880	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	54.98
New Haven, Conn.	Dec. 10, 1873	.....	57.82	55.82	43.82	58.98	51.36	58.12	55.50	45.52	45.52	51.32	47.92	39.45	49.35	12	50.85
New London, Conn.	Jan. 10, 1871	42.50	47.01	42.26	50.59	44.79	43.20	51.31	39.35	51.05	43.23	51.64	50.46	54.37	51.33	14	48.72
Middle Atlantic States:																	
Albany, N. Y.	Dec. 22, 1873	.....	.....	.....	37.98	38.25	38.19	38.09	49.37	38.66	32.54	38.34	33.76	39.37	38.90	11	38.13
New York City.	Nov. 1, 1870	43.80	45.79	50.98	40.84	45.09	47.40	49.94	45.47	38.12	27.84	40.40	48.51	38.83	55.24	14	48.53
Philadelphia, Pa.	Jan. 1, 1871	.....	48.36	55.28	45.28	40.22	47.39	37.38	51.62	38.73	32.58	38.51	45.58	39.17	28.74	13	41.07
Atlantic City, N. J.	Dec. 10, 1873	.....	.....	.....	33.98	39.85	31.95	34.28	52.00	47.43	48.25	46.98	58.29	48.94	54.70	11	43.23
Barnegat City, N. J.	Dec. 10, 1873	.....	.....	.....	55.08	46.78	47.17	48.24	52.00	40.36	48.81	53.28	52.90	48.90	34.53	11	50.18
Cape May, N. J.	May 24, 1871	.....	36.67	49.76	44.26	55.89	43.58	47.63	43.23	50.38	54.30	42.89	51.90	32.62	42.50	13	47.24
Sandy Hook, N. J.	Dec. 10, 1873	.....	.....	.....	51.20	48.31	57.26	53.65	61.70	56.50	41.06	46.74	52.14	44.09	58.78	11	51.49
Delaware Breakwater, Del.	Jan. 28, 1880	.....	.....	.....	32.08	45.28	46.70	43.14	60.09	36.01	41.90	25.60	33.95	33.94	35.17	4	32.62
Baltimore, Md.	Jan. 1, 1871	32.74	35.14	49.37	33.68	45.26	46.70	43.14	60.09	32.83	42.20	46.79	45.71	49.96	14	42.26	
Washington City.	Nov. 1, 1870	27.96	30.86	45.70	34.59	41.11	47.96	32.89	60.09	32.83	38.83	42.20	46.79	45.71	49.96	14	43.87
Cape Henry, Va.	Dec. 15, 1873	.....	.....	.....	51.00	50.60	64.17	64.67	60.86	49.83	63.06	50.13	57.28	41.11	.....	11	56.29
Chincoteague, Va.	Mar. 16, 1880	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	38.48
Lynchburg, Va.	May 24, 1871	.....	30.85	52.61	44.35	41.89	40.04	43.75	45.04	38.81	38.78	35.57	44.90	39.85	37.28	13	42.57
Norfolk, Va.	Jan. 1, 1871	50.65	54.86	55.43	50.41	50.97	46.04	46.75	51.87	55.81	51.84	40.06	57.67	54.80	43.06	14	51.62
South Atlantic States:																	
Charlotte, N. C.	Oct. 6, 1878	.....	.....	.....	68.26	68.26	65.78	102.04	77.18	70.73	92.64	58.81	66.00	76.98	66.41	6	64.10
Hatteras, N. C.	Dec. 1, 1880	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10	74.54
Kitty Hawk, N. C.	Jan. 15, 1875	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9	64.66
Macon, Port, N. C.	May 29, 1878	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	68.16
Smithville, N. C.	Oct. 16, 1876	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9	50.99
Wilmington, N. C.	Jan. 1, 1871	51.87	59.18	58.37	52.43	49.59	68.73	53.66	54.73	51.14	51.91	51.02	52.29	64.00	62.70	14	57.79
Charleston, S. C.	Jan. 5, 1871	63.87	57.06	62.15	62.51	50.97	78.43	78.11	77.44	50.29	44.69	51.35	57.01	51.35	60.22	14	56.91
Augusta, Ga.	Nov. 2, 1870	53.88	53.17	48.50	57.19	54.68	46.16	53.97	49.40	40.99	47.91	49.63	38.90	43.43	50.47	14	48.56
Savannah, Ga.	Jan. 1, 1871	61.06	63.67	48.39	57.43	49.00	64.85	59.60	52.58	45.81	50.28	38.00	47.35	48.43	50.47	14	52.69
Jacksonville, Fla.	Sept. 11, 1871	.....	57.17	60.65	48.31	57.60	56.38	50.58	60.42	47.18	65.51	54.69	53.36	53.34	55.02	13	55.31
Florida Peninsula:																	
Cedar Keys, Fla.	Nov. 7, 1879	.....	.....	.....	32.75	36.35	37.95	38.15	40.08	58.54	32.30	53.03	64.90	33.58	47.68	5	56.70
Key West, Fla.	Nov. 1, 1870	.....	.....	.....	32.75	36.35	37.95	38.15	40.08	58.54	32.30	53.03	64.90	33.58	47.68	14	40.12
Sanford, Fla.	Sept. 1, 1883	34.68	31.77	32.75	32.75	36.35	37.95	38.15	40.08	58.54	33.41	63.10	41.86	44.24	46.81	2	48.71

[illegible]

*Annual and mean annual precipitation, at stations of the Signal Service, United States Army, compiled from the commencement of observations to 1884, inclusive—Continued.*

Stations.	Established.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	Mean annual.		
																Years.	Inches.	
Upper Mississippi Valley—Continued:																		
Dubuque, Iowa.	July 10, 1873	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	11	39.72	
Keokuk, Iowa.	June 18, 1871	29.37	41.04	35.77	48.42	51.65	48.59	31.80	38.97	32.40	40.32	55.15	32.84	39.57	42.80	13	38.13	
Carle, Ill.	June 1, 1871	28.52	50.86	47.58	52.93	55.60	39.47	41.76	45.41	43.51	49.56	32.18	61.54	38.63	51.60	15	46.74	
Springfield, Ill.	July 1, 1870	30.40	45.03	37.98	42.99	47.74	41.28	40.83	23.70	34.56	36.51	58.11	48.79	43.18	47.52	5	37.88	
St. Louis, Mo.	Nov. 1, 1870	22.61													40.64	14	37.88	
Missouri Valley:																		
Leavenworth, Kans.	May 21, 1871	43.50	35.27	32.81	31.26	44.48	52.08	35.15	41.55	36.89	39.95	25.97	41.94	44.72	44.72	13	38.97	
Omaha, Nebr.	Nov. 1, 1870	32.79	32.48	27.04	25.75	42.89	32.51	40.95	30.81	29.52	29.52	19.80	37.68	48.92	47.68	14	36.45	
Bennett, Fort, Dak.	Dec. 22, 1879														18.90	4	17.85	
Huron, Dak.	July 1, 1881														20.84	3	24.07	
Yankton, Dak.	April 1, 1873														22.16	11	28.21	
Extreme Northwest:																		
Moorhead, Minn.	Jan. 1, 1881														28.50	4	28.24	
Saint Vincent, Minn.	Sept. 5, 1880														21.81	4	19.42	
Bismarck, Dak.	Sept. 15, 1874														25.58	10	21.48	
Ruford, Fort, Dak.	Oct. 23, 1878														20.84	6	14.63	
Northern Slope:																		
Assinaboine, Fort, Mont.	Oct. 6, 1879														15.10	8	17.84	
Benton, Fort, Mont.	Oct. 11, 1879	12.52	11.95	10.45	12.75	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	16.81	10.18	13.01	( <sup>1</sup> )	7	12.50	
Custer, Fort, Mont.	Dec. 5, 1878											16.65	11.88	12.05	13.84	5	14.80	
Helena, Mont.	Oct. 15, 1879											19.94	10.32	( <sup>1</sup> )	19.18	3	16.48	
Maginnis, Fort, Mont.	July 14, 1882														18.29	2	11.14	
Poplar River, Mont.	May 1, 1882														10.25	2	8.24	
Shaw, Fort, Mont.	April 1, 1880											14.77	14.21	12.64	13.64	4	13.82	
Deadwood, Dak.	Dec. 25, 1877											23.50	32.83	29.69	24.29	6	26.11	
Cheyenne, Wyo.	Nov. 1, 1870	9.23	13.48	10.01	9.71	12.10	5.03	11.71	12.04	7.34	8.38	11.88	8.64	19.24	15.54	14	11.07	
North Platte, Nebr.	Sept. 18, 1874											22.93	17.95	30.01	13.53	10	19.32	
Middle Slope:																		
Denver, Colo.	Nov. 19, 1871	18.05	11.81	13.46	17.25	20.12	16.38	15.51	10.86	9.58	12.78	14.49	19.49	15.07	13	14.90		
Pike's Peak, Colo.	Nov. 1, 1873	26.96	24.74	23.87	25.58	42.87	39.82	40.65	44.57	28.82	11.12	15.70	11.12	15.70	11	29.57		
West Las Animas, Colo.	Oct. 1, 1881														13.41	2	13.41	
Dodge City, Kans.	Sept. 15, 1874											33.55	13.14	28.50	30.36	10	21.11	
Elliott, Fort, Tex.	Nov. 29, 1879											18.19	16.16	24.76	28.21	5	23.97	
Southern Slope:																		
Sill, Fort, Ind. T.	June 23, 1875											25.07	33.75	28.22	31.13	( <sup>1</sup> )	38.38	
Concho, Fort, Tex.	Oct. 10, 1875											18.96	42.12	82.64	41.91	7	30.99	
Davis, Fort, Tex.	Dec. 24, 1877											23.48	( <sup>1</sup> )	20.23	14.22	22.56	5	20.38
Stockton, Fort, Tex.	Feb. 24, 1876											5.12	25.56	27.39	24.07	7	20.09	



Southern Plateau:	Nov. 5, 1877																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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**No record.**

## APPENDIX 31.

Monthly and annual precipitation, from reports made by voluntary observers of the Signal Service, United States Army, for the year ending December 31, 1884.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Accotink, Va.	4.53	5.70	5.77	1.86	3.25	5.53	8.13	0.97	( <sup>1</sup> )	1.42	2.61	3.83	43.00
Aiken, S. O.	2.58	3.08	7.16	4.40	3.13	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	1.91	6.02	.....
Ainsworth, Wash.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	0.67	0.07	0.90	0.23	0.35	0.67	0.56	( <sup>1</sup> )	( <sup>1</sup> )	.....
Albany, Oreg.	3.91	6.90	3.12	4.30	0.89	3.38	1.87	0.43	5.61	2.85	2.18	7.33	45.22
Albion, Idaho	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	1.00	1.90	0.60	7.84	.....
Allison, Kans.	0.22	0.03	2.81	1.90	2.04	2.34	6.64	2.14	0.65	1.50	0.13	0.90	22.86
Amherst, Mass.	3.90	4.62	5.67	2.48	2.02	1.38	3.75	5.10	1.25	2.40	2.58	5.58	40.38
Andersonville, Ga.	( <sup>1</sup> )	3.18	7.52	4.17	1.27	( <sup>1</sup> )	3.73	4.10	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	.....
Anna, Ill.	2.01	5.38	4.05	3.80	4.99	7.44	5.49	2.65	3.33	1.42	2.58	9.57	52.71
Ann Arbor, Mich.	1.07	( <sup>1</sup> )	( <sup>1</sup> )	1.05	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	2.91	( <sup>1</sup> )	1.84	( <sup>1</sup> )	.....
Antrim, N. H.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	4.70	2.95	1.30	2.95	2.75	2.70	2.55	3.35	5.10	.....
Archer, Fla.	5.43	2.14	5.33	2.45	4.72	11.66	3.33	5.35	1.95	0.29	3.80	3.75	55.70
Ardenia (Phillipstown), N. Y.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	2.43	1.91	3.38	3.07	2.23	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	.....
Ashland, N. H.	5.55	6.29	5.64	2.89	( <sup>1</sup> )	3.06	3.62	4.35	1.07	2.79	3.76	5.10	.....
Asheville, N. O.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	1.10	2.90	.....
Ashwood, Tenn.	6.30	7.30	6.10	6.00	3.90	3.80	7.00	1.70	0.60	2.40	1.70	3.70	51.00
Atchison, Kans.	( <sup>1</sup> )	0.81	2.75	5.47	2.60	5.75	5.50	4.30	5.90	2.90	1.30	0.90	.....
Athens, Ga.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	6.07	0.32	10.46	5.70	2.62	0.01	0.51	3.76	5.97	.....
Auburn, N. Y.	2.96	1.88	1.71	0.30	3.67	1.68	2.78	2.77	3.55	3.88	2.05	2.41	29.14
Austin, Tenn.	5.95	8.27	8.25	2.10	3.47	( <sup>1</sup> )	4.08	2.29	1.51	2.71	1.77	3.34	.....
Austin, Tex.	( <sup>1</sup> )	( <sup>1</sup> )	4.45	7.78	7.85	1.46	( <sup>1</sup> )	0.04	1.76	2.63	3.40	1.68	.....
Bainbridge Island, Wash.	4.40	3.53	0.97	2.50	0.55	2.70	0.10	1.35	2.48	6.20	2.55	( <sup>1</sup> )	.....
Bandon, Oreg.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	3.96	0.53	1.22	1.05	( <sup>1</sup> )	5.13	3.12	3.93	13.65	.....
Belmont, N. H.	4.09	4.41	4.37	4.10	( <sup>1</sup> )	1.43	2.27	4.25	0.72	2.52	4.01	4.22	.....
Beloit, Wis.	0.64	( <sup>1</sup> )	1.52	2.85	2.62	5.15	4.27	2.94	2.22	3.68	1.72	4.24	.....
Belvidere, N. J.	4.49	4.78	( <sup>1</sup> )	2.36	( <sup>1</sup> )	( <sup>1</sup> )	6.12	5.90	1.21	2.95	( <sup>1</sup> )	( <sup>1</sup> )	.....
Bethel, Conn.	4.55	5.10	3.30	1.90	3.05	3.90	7.16	6.20	1.07	3.20	3.95	6.52	49.96
Blackburg, Va.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	3.09	2.85	1.00	0.84	1.00	2.19	.....
Blooming Grove, Pa.	2.20	2.81	( <sup>1</sup> )	1.40	3.30	3.50	8.50	4.70	( <sup>1</sup> )	( <sup>1</sup> )	3.00	3.40	.....
Blue Lake, Cal.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	1.55	0.24	0.01	3.23	2.17	1.87	2.64	.....
Bowling Green, Ky.	4.69	6.89	5.12	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	3.97	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	1.99	( <sup>1</sup> )	.....
Brevard, N. C.	6.72	10.07	14.53	5.02	2.21	12.94	( <sup>1</sup> )	2.57	0.70	0.79	4.05	10.25	.....
Bristol, N. H.	4.41	5.67	3.08	2.37	3.59	2.10	2.64	6.00	0.52	2.32	2.98	5.05	41.43
Bunker Hill, Ill.	1.51	4.11	3.79	2.33	4.27	3.96	2.30	2.56	7.19	2.33	1.86	5.80	42.01
Burlington, Vt.	2.14	2.68	2.89	1.92	3.60	1.36	( <sup>1</sup> )	1.22	3.82	2.95	2.60	.....	.....
Cahuenga, Cal.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	0.69	0.81	0.00	( <sup>1</sup> )	( <sup>1</sup> )	0.51	1.17	3.86	.....
Caldwell, N. J.	5.54	6.51	4.65	3.20	4.56	5.60	6.63	6.50	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	.....
Carson City, Nev.	2.46	2.77	3.23	1.29	0.29	1.97	0.00	0.62	0.22	0.22	0.00	4.75	17.82
Catawissa, Pa.	3.17	3.61	4.08	2.92	3.38	3.63	2.83	2.27	2.66	3.69	2.98	3.77	38.90
Cath Soph, S. A.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	9.10	5.34	3.62	2.59	1.16	2.94	0.00	( <sup>1</sup> )	.....
Cedar Rapids (W), Iowa.	3.71	1.41	2.47	2.12	3.08	3.38	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	1.37	3.54	.....
Chambersburg, Pa.	3.23	4.43	4.90	1.2	4.42	5.22	5.20	2.22	0.89	2.27	1.51	4.33	40.34
Chapel Hill, N. C.	4.95	2.58	6.20	2.66	4.97	3.69	6.63	4.64	0.52	0.63	( <sup>1</sup> )	6.98	.....
Charlottesville, Va.	3.60	4.90	4.25	2.90	4.40	2.20	5.00	2.00	3.00	4.10	4.00	4.50	45.75
Chester, Minn.	( <sup>1</sup> )	( <sup>1</sup> )	0.48	2.83	2.88	4.73	3.38	7.79	6.20	3.47	0.65	0.95	.....
Cincinnati (G. W. H.), Ohio.	1.59	6.45	2.24	2.34	4.97	2.38	0.26	( <sup>1</sup> )	3.72	1.25	1.08	3.36	.....
Clarksville, Tex.	2.49	10.38	2.93	( <sup>1</sup> )	9.53	5.77	0.12	4.65	1.03	1.78	2.60	7.48	.....
Clay Centre, Kans.	0.71	1.11	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	3.23	3.98	5.68	6.02	2.24	1.28	1.12	.....
Cleburne, Tex.	0.68	4.12	6.25	3.64	5.03	10.09	0.32	0.62	1.00	2.01	3.00	4.01	40.97
Cleveland, Ohio.	2.48	5.01	2.42	1.91	3.00	2.06	4.01	1.90	8.77	1.87	2.02	2.82	33.37
Clinton, Ind.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	4.30	10.64	7.91	0.75	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	.....
Cockburn Harbor, B. W. I.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	0.26	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	7.15	0.90	2.36	.....
College City, Cal.	3.61	2.21	5.46	2.48	0.17	2.04	0.00	( <sup>1</sup> )	0.36	0.29	0.69	5.14	.....
College Hill, Ohio.	3.60	5.00	2.00	2.25	4.75	2.00	1.70	0.70	4.38	2.70	0.50	4.12	33.60
Collinsville, Ill.	0.82	4.46	2.88	3.44	4.21	3.73	2.21	1.82	3.66	1.64	2.18	5.68	36.71
Conception, Mo.	0.75	0.43	2.41	2.44	3.84	3.02	6.12	2.02	4.07	2.92	0.94	1.46	30.43
Contocook, N. H.	4.15	5.00	4.20	( <sup>1</sup> )	2.35	1.05	2.00	2.00	( <sup>1</sup> )	1.75	( <sup>1</sup> )	4.50	.....
Cooperstown, N. Y.	3.17	3.18	4.48	1.20	3.97	2.16	3.01	2.46	1.29	3.31	2.38	4.00	35.07
Cornish, Me.	2.74	7.28	5.31	( <sup>1</sup> )	4.38	1.88	5.27	4.53	1.39	3.56	3.00	5.92	.....
Cresco, Iowa.	0.38	1.51	1.64	2.71	2.44	4.47	4.23	8.34	3.18	2.83	0.66	2.30	34.69
Crete, Nebr.	0.41	0.41	1.20	3.02	1.79	1.39	5.94	3.18	1.46	3.86	0.02	0.19	22.81
Cumberland, Md.	1.35	3.64	5.14	1.96	5.33	3.35	4.61	1.49	0.93	1.98	0.92	4.25	35.43
Dale Enterprise, Va.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	1.97	5.65	1.32	0.91	2.86	5.04	.....

<sup>1</sup> No record.<sup>2</sup> Inappreciable.

Monthly and annual precipitation, from reports made by voluntary observers of the Signal Service, United States Army, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
De Soto, Nebr.	0.65	1.23	3.20	2.39	1.81	3.99	7.87	5.95	8.11	4.52	0.12	1.20	41.04
Distributing Reservoir, D. C.	5.28	7.19	7.00	2.37	1.90	6.20	8.03	0.83	0.22	1.62	8.23	4.63	48.50
Dorset, Vt.	2.61	5.17	4.93	4.29	3.96	2.66	2.52	4.99	0.85	4.69	4.78	4.63	44.18
Drifton, Pa.	4.30	( <sup>1</sup> )	4.04	4.36	3.62	2.88	6.77	4.79	2.50	2.67	3.83	4.76	.....
Dudley, Mass.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	2.93	( <sup>1</sup> )	( <sup>1</sup> )	3.24	1.06	1.03	2.14	( <sup>1</sup> )	.....
Dudbury, Pa.	3.75	5.59	3.63	3.00	3.86	1.37	6.02	8.43	2.53	2.34	2.48	3.74	41.94
East Harbor, B. W. I.	1.52	1.04	( <sup>1</sup> )	( <sup>1</sup> )	5.91	4.53	( <sup>1</sup> )	2.76	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	.....
Easton, Pa.	4.73	4.77	4.97	2.38	2.28	2.87	5.19	5.91	1.01	3.96	3.26	6.07	47.40
East Portland, Oreg.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	2.16	0.09	0.12	2.04	0.03	0.08	3.14	( <sup>1</sup> )	2.97	.....
Eik Falls, Kans.	2.50	1.50	( <sup>1</sup> )	4.00	4.00	2.00	7.50	6.00	6.00	3.00	2.60	4.02	.....
Embarra, Wis.	( <sup>1</sup> )	( <sup>1</sup> )	1.75	3.40	3.75	3.35	6.25	7.70	9.40	7.85	2.60	5.51	.....
Emmitsburg, Md.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	2.14	7.19	0.40	( <sup>1</sup> )	0.82	1.55	3.08	4.00	.....
Esperanza, Kans.	( <sup>1</sup> )	1.16	( <sup>1</sup> )	4.38	2.49	4.34	4.71	4.43	3.15	1.72	1.93	1.81	.....
Eola, Oreg.	3.48	5.54	2.49	3.09	0.42	1.67	2.29	0.17	6.59	2.80	2.83	6.09	37.44
Factoryville, N. Y.	2.42	2.07	4.37	1.49	3.54	1.24	2.63	2.07	1.74	2.86	1.41	2.73	28.57
Fall Brook, Cal.	3.58	15.39	10.90	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	0.58	0.54	7.15	.....
Fall River, Mass.	6.25	6.15	5.63	3.71	4.25	4.05	5.19	6.33	0.83	2.17	3.56	6.04	55.06
Fallington, Pa.	4.90	5.04	4.79	2.25	4.45	5.30	4.24	4.58	0.22	2.30	3.12	6.00	47.23
Fallston, Md.	4.16	7.01	5.71	1.94	3.86	5.00	3.37	3.00	0.22	1.48	3.14	6.06	45.16
Fayetteville, Ark.	2.70	3.95	3.52	5.03	4.14	4.77	5.48	3.77	4.92	2.17	( <sup>1</sup> )	( <sup>1</sup> )	.....
Flat Rock, N. C.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	3.51	1.81	0.53	0.03	( <sup>1</sup> )	.....
Foreyth, Ga.	3.97	4.37	11.93	4.93	1.72	6.73	( <sup>1</sup> )	4.30	1.60	0.10	3.86	4.73	.....
Fort Collins, Colo.	( <sup>1</sup> )	( <sup>1</sup> )	1.15	3.92	4.84	( <sup>1</sup> )	1.25	( <sup>1</sup> )	( <sup>1</sup> )	0.10	0.15	0.35	.....
Fort Madison, Iowa	0.90	1.50	4.70	2.00	4.95	4.23	1.41	6.87	2.37	5.40	1.90	3.16	40.59
Fort Scott, Kans.	1.45	2.33	2.44	7.53	9.08	3.83	10.76	4.71	11.45	2.33	( <sup>1</sup> )	4.00	.....
Fort Wayne, Ind.	2.50	4.01	2.73	1.51	4.02	2.05	5.93	1.96	2.25	3.40	1.50	4.95	35.50
Frankfort, Ky.	5.05	3.56	( <sup>1</sup> )	3.32	5.29	2.90	( <sup>1</sup> )	0.66	0.07	1.64	( <sup>1</sup> )	4.16	.....
Franklin, Pa.	3.20	4.35	3.66	1.47	2.39	5.54	4.85	3.38	2.64	3.08	1.77	3.72	42.00
Franklin, Wis.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	6.30	3.45	2.63	( <sup>1</sup> )	3.48	1.37	4.24	( <sup>1</sup> )	2.25	.....
Fremont, Nebr.	1.60	1.19	2.76	3.20	1.40	3.29	9.08	( <sup>1</sup> )	5.81	2.72	0.21	2.01	.....
Gardiner, Mo.	5.40	7.29	5.40	6.53	4.00	1.22	5.17	4.22	2.10	3.76	1.82	3.79	52.82
Garrettsville, Ohio	5.45	( <sup>1</sup> )	4.17	1.53	1.79	1.49	5.30	1.62	3.70	2.56	1.68	2.99	.....
Genoa, Nebr.	0.70	1.20	2.75	3.05	4.20	2.47	7.80	3.85	8.02	2.80	0.05	1.95	33.04
Germantown, Pa.	( <sup>1</sup> )	( <sup>1</sup> )	4.18	2.02	3.25	4.57	5.28	4.02	0.14	2.22	( <sup>1</sup> )	3.79	.....
Grampan Hills, Pa.	3.29	4.69	5.10	3.00	2.86	9.85	5.49	4.07	2.14	3.76	1.82	3.65	49.52
Grand Coteau, La.	9.88	2.50	10.29	5.62	14.03	2.50	2.84	1.75	0.75	3.81	3.57	14.43	71.88
Grand Junction, Colo.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	1.74	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	1.62	0.18	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	.....
Grand Turk Island, B. W. I.	1.10	0.90	1.37	0.04	2.33	2.24	( <sup>1</sup> )	1.67	( <sup>1</sup> )	8.21	3.38	1.98	.....
Great Falls Reservoir, Md.	5.10	5.75	5.84	1.98	3.19	6.80	4.50	1.73	( <sup>1</sup> )	1.73	3.41	1.16	.....
Green Springs, Ala.	7.67	6.48	9.17	1.19	1.18	7.57	12.02	1.64	1.25	2.41	2.02	5.39	61.39
Guttenberg, Iowa	0.76	1.79	1.87	1.60	2.84	1.48	2.95	4.51	5.50	2.78	0.66	3.00	30.04
Hartford, Conn.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	3.36	1.73	5.93	2.87	0.79	2.88	2.78	0.09	.....
Haverford College, Pa.	( <sup>1</sup> )	5.88	4.92	2.47	3.33	5.72	5.10	3.24	0.20	2.24	3.48	5.32	.....
Helvetia, W. Va.	6.00	5.24	4.96	2.70	4.51	5.69	5.12	4.30	0.92	2.45	2.66	4.00	48.85
Highlands, N. C.	3.60	10.10	13.55	5.40	2.45	8.33	3.87	4.03	1.40	1.42	4.54	11.94	70.15
Hillsdale, Mich.	1.11	4.36	2.48	1.70	4.13	5.39	1.06	0.62	2.64	3.48	2.41	4.14	33.52
Hiram, Ohio	5.14	( <sup>1</sup> )	5.28	1.92	( <sup>1</sup> )	1.64	4.12	1.63	4.25	2.83	2.17	3.49	.....
Holton, Kans.	1.12	0.37	4.75	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	3.12	1.40	1.30	.....
Hudson, Mich.	2.36	3.42	( <sup>1</sup> )	( <sup>1</sup> )	4.58	3.61	1.39	1.20	1.72	3.68	1.68	2.33	.....
Hulmeville, Pa.	3.15	5.60	( <sup>1</sup> )	( <sup>1</sup> )	1.80	4.87	3.55	2.69	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	.....
Humboldt, Iowa	0.20	1.19	3.04	3.27	2.62	3.47	3.49	4.27	5.66	3.06	0.69	2.50	34.86
Humphrey, N. Y.	2.14	3.62	3.50	2.14	5.11	14.15	5.27	4.80	4.82	3.93	2.93	3.69	50.10
Hydesville, Cal.	4.43	4.30	7.03	6.28	0.50	0.63	0.05	0.02	1.02	0.94	0.69	( <sup>1</sup> )	.....
Independence, Iowa	1.35	1.70	3.15	1.68	3.70	4.55	6.60	7.45	10.90	2.10	1.10	2.04	43.62
Independence, Kans.	0.68	2.23	1.00	4.85	1.27	2.52	5.77	5.83	9.71	4.22	2.58	3.34	44.00
Indianola, Iowa	0.38	1.98	2.50	1.83	3.50	3.80	11.51	2.81	3.94	4.43	1.19	2.29	40.23
Ionia, Mich.	2.24	3.37	3.51	2.16	2.81	2.93	3.02	0.55	3.26	4.30	1.91	5.25	35.31
Ithaca, N. Y.	3.13	2.64	3.41	1.88	4.36	1.35	4.87	3.75	1.72	2.00	1.74	2.42	34.17
Jacksonburg, Ohio	2.60	7.65	3.10	2.55	5.40	1.85	1.70	1.20	( <sup>1</sup> )	1.15	0.85	3.40	.....
Jeffersonville, Ind.	( <sup>1</sup> )	8.81	3.60	2.30	4.94	4.06	3.54	3.36	5.27	1.81	1.65	4.72	.....
Johanna Maria, S. A.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	5.68	10.68	1.77	1.45	1.00	0.45	0.00	( <sup>1</sup> )	.....
Johnstown, Va.	6.65	6.55	8.75	1.70	( <sup>1</sup> )	1.05	4.05	2.10	( <sup>1</sup> )	( <sup>1</sup> )	0.90	4.90	.....
Kalamazoo, Mich.	( <sup>1</sup> )	4.22	( <sup>1</sup> )	2.11	3.96	4.86	2.59	1.82	2.39	2.88	1.81	7.14	.....
Kelley's (near Raleigh), N. C.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	7.25	7.80	( <sup>1</sup> )	3.10	9.40	.....
Kennewick, Wash.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	0.44	0.86	.....
Kew, B. W. I.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	0.78	12.09	7.64	( <sup>1</sup> )	3.26	( <sup>1</sup> )	12.14	2.36	4.65	.....
Klamath Agency, Oreg.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	0.24	0.02	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	10.58	.....
Laconia, Ind.	3.19	9.19	5.03	2.46	4.07	4.73	3.42	4.12	5.13	2.00	1.04	4.48	48.88
Lafayette, Ind.	1.09	5.08	1.87	2.79	3.31	4.81	5.81	1.12	2.43	2.54	1.44	6.27	37.87
Lake Village, N. H.	4.16	5.92	5.31	3.40	( <sup>1</sup> )	1.88	4.32	3.32	0.83	2.18	3.52	4.12	.....
Lancaster, Wis.	( <sup>1</sup> )	( <sup>1</sup> )	2.02	2.22	3.30	4.82	5.28	5.65	4.53	3.35	0.72	4.02	.....
Lansing, Mich.	1.92	3.24	3.71	2.12	4.34	3.09	3.24	1.34	2.71	6.91	1.69	2.77	36.99
Lawrence, Kans.	1.23	1.13	2.78	5.62	3.57	3.81	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	2.38	0.80	2.56	.....
Lead Hill, Ark.	2.05	10.93	3.95	3.89	5.93	3.57	5.04	4.78	5.14	0.94	4.71	11.37	62.80

<sup>1</sup> No record.

<sup>2</sup> Inappreciable.

Monthly and annual precipitation, from reports made by voluntary observers of the Signal Service, United States Army, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Leetadale, Pa.	In. 5.33	In. 5.11	In. 3.97	In. 1.28	In. 2.88	In. 5.29	In. 7.01	In. 2.07	In. 1.99	In. 2.22	In. 1.43	In. 4.34	In. 43.43
Lenoir, N. C.	3.80	4.90	9.40	4.50	2.40	10.30	1.70	3.30	0.60	0.70	1.00	8.10	50.70
Le Roy, N. Y.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	3.07	2.22	1.77	1.92	2.18	
Limona, Fla.	0.38	0.71	2.15	3.20	3.43	9.45	4.75	8.28	3.75	0.96	1.45	0.80	39.31
Lincolnton, N. C.	(1)	(1)	(1)	(1)	(1)	4.47	2.51	1.51	0.17	0.99	2.61	1.82	
Logan, Iowa	1.30	1.50	1.70	3.10	2.10	3.40	7.40	5.00	5.50	4.40	0.10	1.10	36.60
Logansport, Ind.	1.80	4.48	1.50	2.19	3.42	4.25	1.77	1.83	1.29	3.26	1.82	5.82	35.78
Luling, La.	(1)	(1)	(1)	(1)	(1)	(1)	3.60	0.86	3.84	(1)	(1)	(1)	
Lunenburg, Vt.	8.20	2.30	1.50	0.86	4.25	1.95	2.50	2.40	2.65	5.00	1.90	2.80	31.31
Madison, Nebr.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	3.35	(1)	(1)	(1)	0.08	
Madison, Wis.	(1)	(1)	2.31	4.51	4.21	5.47	8.44	4.39	4.25	4.60	1.53	5.88	
Manatee, Fla.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	3.73	6.08	3.06	1.46	2.06	
Manchester, Iowa.	(1)	1.33	1.99	2.31	2.57	3.99	3.78	2.42	7.25	2.48	1.12	2.57	
Manhattan, Kans.	(1)	0.52	2.68	3.45	5.13	(1)	6.33	5.02	5.64	2.48	(1)	(1)	
Manistique, Mich.	0.94	4.47	0.84	2.32	1.76	0.97	3.47	4.50	6.63	6.83	2.35	5.05	40.43
Manitowoc, Wis.	(1)	1.59	4.30	2.43	5.16	5.44	4.81	1.55	5.03	(1)	(1)	(1)	
Margaretta Township, Ohio.	1.18	4.67	2.99	1.48	3.46	2.15	5.62	1.71	3.38	1.06	0.72	2.85	31.27
Marion, Va.	4.42	5.82	6.70	3.37	2.04	3.97	1.22	3.27	0.03	1.10	0.44	4.60	36.98
Marquette, Nebr.	7.75	3.37	4.68	3.13	5.36	1.58	8.25	1.70	1.79	2.17	(1)	0.60	
Marshall, Mich.	2.80	3.90	(1)	0.51	8.83	4.72	3.73	1.08	1.48	3.67	(1)	(1)	
Mattoon, Ill.	0.90	5.44	2.75	4.16	5.00	6.87	0.35	2.20	4.70	2.80	1.83	5.45	45.75
Maud, Kans.	(1)	(1)	(1)	2.45	(1)	5.87	1.77	3.63	0.19	0.78	2.06	0.80	
Mayport, Fla.	3.53	3.62	3.06	1.82	4.41	7.23	6.68	6.32	5.55	3.51	3.78	2.96	51.52
Mazatlan, Mex.	3.88	(1)	(1)	(1)	1.50	2.01	0.26	5.00	16.50	3.58	0.51	2.03	
McDonogh, Md.	(1)	6.04	5.24	1.38	3.18	2.95	5.44	2.11	0.18	1.64	3.88	3.81	
Menand Station (near Albany), N. Y.	0.95	1.75	4.89	1.07	2.89	1.96	3.95	6.16	1.57	3.00	3.96	3.13	35.22
Mendon, Mass.	(1)	(1)	(1)	(1)	2.30	(1)	(1)	(1)	(1)	(1)	1.10	(1)	
Mendon, Mich.	(1)	(1)	(1)	1.97	5.39	2.19	3.33	1.87	2.07	(1)	(1)	(1)	
Milan, Tenn.	4.45	7.96	4.49	5.35	4.98	8.64	8.51	1.58	4.95	2.82	1.61	7.25	57.99
Milledgeville, Ga.	(1)	(1)	8.88	4.51	1.69	7.64	2.52	3.38	0.00	0.69	1.54	5.57	
Milton, Mass.	5.72	5.46	4.70	4.21	8.01	4.22	3.75	4.20	0.65	2.98	3.43	4.27	46.60
Minneapolis, Minn.	0.73	0.22	0.95	1.72	2.99	4.18	(1)	3.91	5.27	3.08	0.66	2.31	
Monticello, Iowa	0.61	1.15	3.80	1.86	3.74	2.82	3.99	3.78	6.80	3.19	1.59	4.34	37.77
Moorestown, N. J.	4.36	5.33	4.64	1.65	3.29	3.52	3.78	5.08	0.16	2.29	3.40	5.37	42.87
Mottville, Mich.	1.12	3.34	3.58	1.58	27.16	(1)	2.00	0.70	(1)	(1)	1.99	(1)	
Mountainville, N. Y.	5.84	4.49	3.96	2.45	(1)	3.73	7.72	3.42	0.98	3.38	4.14	5.23	
Mount Forest, Canada.	(1)	(1)	0.94	(1)	(1)	4.88	7.18	(1)	2.73	(1)	(1)	(1)	
Mount Ida, Ark.	2.30	9.80	4.90	8.30	10.25	2.25	3.00	1.05	2.65	0.70	2.55	15.95	66.00
Muscataine, Iowa	1.05	1.40	4.28	2.08	5.57	4.03	3.63	5.77	2.35	3.46	1.87	4.42	45.49
Nayatt Point, R. I.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	2.65	4.60	7.08	7.03	(1)	
Nellisville, Wis.	(1)	(1)	0.79	1.80	3.30	3.41	6.05	6.32	6.80	4.00	0.26	2.31	
Nephi, Utah	0.86	3.70	2.15	6.30	2.70	0.50	0.25	0.35	1.70	2.05	0.00	5.40	26.96
New Athens, Ohio	(1)	(1)	(1)	(1)	(1)	(1)	1.39	2.46	2.39	1.37	4.42	(1)	
New Bedford, Mass.	4.70	5.67	(1)	(1)	3.87	(1)	0.48	3.41	0.96	1.61	3.49	5.97	
Newport, Vt.	3.55	4.03	3.61	2.56	6.79	4.33	3.71	3.45	3.32	5.88	4.16	3.21	48.60
New Tacoma, Wash.	4.93	(1)	1.27	(1)	(1)	2.81	1.80	1.29	3.21	(1)	1.84	4.88	
New Ulm, Tex.	3.43	2.58	4.86	4.68	15.25	2.62	0.00	0.21	5.18	1.78	4.99	(1)	
North Colebrook, Conn.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	2.50	3.99	5.30	
Northfield, Minn.	0.75	1.82	1.17	2.02	2.56	5.16	2.69	3.48	5.51	3.45	0.60	2.23	31.54
North Lewisburg, Ohio	1.90	4.55	3.10	1.75	2.05	1.90	4.35	0.80	7.60	1.05	0.85	4.40	34.30
Northport, Mich.	4.00	2.15	4.58	16.50	19.85	5.60	10.75	3.25	1.75	1.24	7.00	2.00	78.67
North Volney, N. Y.	3.70	3.25	3.90	0.80	(1)	1.15	2.50	3.20	2.20	3.00	2.40	3.50	
Oakland, Cal.	3.81	5.25	8.59	5.79	0.55	3.03	(2)	0.25	0.35	2.80	0.05	7.73	38.20
Orono, Me.	4.44	6.85	4.37	3.38	5.42	1.87	2.38	3.12	2.19	2.70	3.99	4.74	44.95
Ottumwa, Iowa	(1)	1.11	3.45	3.51	4.00	4.91	5.44	4.92	2.89	5.54	1.21	3.12	
Palermo, N. Y.	5.05	3.60	3.23	0.68	1.48	1.27	1.69	2.19	1.91	2.65	2.18	3.42	29.85
Paramaribo (Dutch Guiana), S. A.	6.50	(1)	(1)	(1)	18.33	8.45	8.16	1.74	2.20	0.29	1.27	2.97	
Paterston, N. J.	5.16	5.74	3.20	2.40	4.47	(1)	6.46	(1)	0.68	(1)	(1)	(1)	
Penn Yan, N. Y.	3.28	2.16	2.68	1.33	2.73	2.82	3.69	2.13	1.82	1.52	1.00	1.99	26.73
Peoria, Ill.	0.70	3.18	2.17	2.62	5.50	3.67	6.67	4.13	5.76	4.80	2.19	1.31	41.90
Phillipsburg, N. J.	3.88	4.38	3.47	2.07	(1)	3.78	4.91	3.40	4.01	1.58	2.72	4.59	
Pierce City, Mo.	0.90	4.70	1.30	5.60	4.10	4.20	1.50	3.70	7.80	(1)	(1)	(1)	
Plant Waterloo, S. A.	(1)	(1)	(1)	(1)	(1)	0.85	0.88	4.59	1.02	0.00	0.00	(1)	
Pleasant Grove, Wash.	(1)	(1)	0.62	1.26	0.17	0.47	1.18	(1)	0.33	0.71	0.16	2.07	
Point Pleasant, La.	(1)	(1)	(1)	(1)	(1)	(1)	0.00	0.14	0.44	7.99	20.39	(1)	
Port Jervis, N. Y.	3.62	4.29	4.45	3.29	3.75	2.12	5.56	5.18	1.15	2.29	3.39	4.23	43.33
Portsmouth, Ohio	5.34	6.11	5.55	3.90	4.89	3.47	2.45	1.35	1.87	1.22	1.46	4.70	42.31
Poway, Cal.	1.59	(1)	6.96	4.81	2.26	0.44	(1)	(1)	(1)	0.24	0.88	5.91	
Prairie du Chien, Wis.	(1)	(1)	(1)	(1)	(1)	2.42	3.10	4.19	5.91	5.41	2.80	1.70	7.79
Princeton, Cal.	4.03	2.35	5.06	2.71	0.05	2.12	0.00	(1)	1.18	1.10	(1)	6.03	
Princeton, Mass.	7.56	7.44	6.91	5.75	3.20	3.45	4.57	5.78	1.59	2.99	5.29	0.59	64.21
Providence, R. I.	(1)	(1)	(1)	4.25	2.94	4.31	(1)	(1)	1.41	2.73	3.60	6.59	

<sup>1</sup> No record.

<sup>2</sup> Inappreciable.

Monthly and annual precipitation, from reports made by voluntary observers of the Signal Service, United States Army, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Pueblo, Colo.	In. 0.57	In. 0.72	In. 0.05	In. 3.53	In. 1.60	In. 2.85	In. 0.72	In. 2.85	In. 0.40	In. (°)	In. 0.05	In. 0.78	In. 13.03
Puerto de Luna, N. Mex.	(°)	(°)	(°)	(°)	(°)	(°)	(°)	(°)	(°)	(°)	(°)	(°)	(°)
Quakertown, Pa.	2.96	4.74	4.99	2.70	3.53	6.54	7.92	3.76	(°)	(°)	8.53	6.46	.....
Quitman, Ga.	6.00	(°)	5.05	(°)	(°)	(°)	(°)	(°)	(°)	0.40	2.00	6.80	.....
Raleigh, N. C.	5.70	(°)	(°)	(°)	1.20	(°)	(°)	3.60	7.00	0.50	(°)	4.50	.....
Readington, N. J.	(°)	(°)	(°)	(°)	3.40	8.80	5.80	3.90	0.40	2.40	4.30	7.00	.....
Receiving Reservoir, D.C.	5.60	6.82	6.60	2.67	2.70	8.12	5.99	0.89	0.24	(°)	3.36	5.08	.....
Red Willow, Nebr.	0.83	(°)	1.10	1.47	5.34	2.28	7.04	5.24	0.12	0.73	0.20	1.17	.....
Richardson, Dak.	(°)	0.90	1.90	4.02	1.40	6.00	5.20	6.40	2.50	0.70	0.70	1.50	.....
Richmond, Ky.	(°)	(°)	(°)	3.63	2.43	3.21	6.35	1.74	3.90	2.29	1.58	2.76	.....
Riley, Ill.	0.80	2.20	1.51	2.85	2.56	4.22	4.19	3.36	4.34	3.85	1.79	3.28	34.95
Ripon, Wis.	(°)	(°)	2.15	2.26	0.75	2.93	5.90	(°)	(°)	(°)	(°)	(°)	.....
Rockford, Ill.	1.42	1.91	2.88	3.45	3.43	6.16	6.13	3.68	3.85	6.24	1.90	6.51	47.08
Rowe, Mass.	3.27	5.10	4.05	1.85	3.15	1.60	5.10	8.22	0.95	3.02	7.70	5.03	40.64
Ruggles, Ohio	2.20	3.75	(°)	0.85	2.60	1.45	2.30	1.00	3.80	1.45	0.85	2.15	.....
Sacramento, Cal.	3.18	4.10	7.63	4.30	0.09	1.57	0.00	0.01	0.57	1.85	(°)	8.89	82.19
Salern, N. J.	(°)	(°)	(°)	3.06	1.32	2.49	2.20	2.47	0.74	1.34	3.15	(°)	.....
Salina, Kans.	0.02	0.05	1.09	2.09	2.07	5.09	5.00	3.09	1.04	0.09	0.08	0.06	19.77
Salinas City, Cal.	1.70	4.49	5.09	3.05	0.72	2.66	0.00	0.18	0.11	1.79	(°)	4.46	.....
Salt Cav. B. W. I.	0.83	0.52	(°)	0.24	1.01	1.23	(°)	1.17	(°)	12.27	3.64	8.75	.....
Sandwich, Ill.	(°)	3.48	2.08	(°)	2.10	3.24	7.06	1.93	2.52	4.95	1.46	5.23	.....
San Rafael, Cal.	(°)	(°)	(°)	(°)	(°)	(°)	(°)	0.09	0.28	3.03	0.17	20.96	.....
Sherlock, Kans.	(°)	(°)	0.45	0.38	7.94	3.79	5.31	8.20	1.09	1.40	0.24	1.38	.....
Snowville, Va.	(°)	(°)	(°)	(°)	2.20	7.80	3.90	0.24	(°)	(°)	(°)	(°)	.....
Somerset, Mass.	6.00	4.12	4.91	4.83	2.93	3.56	4.65	0.03	0.94	2.10	3.40	5.67	47.14
Somerville, N. J.	4.68	4.68	3.73	2.12	2.88	6.20	4.44	2.44	0.26	2.92	5.85	5.78	45.98
Southington, Conn.	4.18	4.76	3.49	3.05	2.46	2.06	4.08	4.18	0.53	2.85	2.85	6.45	40.44
South Orange, N. J.	6.00	4.85	4.28	2.35	3.30	6.02	5.05	7.23	0.15	2.90	3.30	4.40	50.83
Spiceland, Ind.	(°)	(°)	(°)	(°)	4.23	2.11	2.08	0.40	4.25	1.81	1.31	6.47	.....
Springfield, Ark.	4.15	10.15	(°)	4.39	(°)	1.14	1.67	0.42	(°)	(°)	(°)	(°)	.....
Springfield, Mo.	(°)	(°)	(°)	(°)	5.48	2.67	9.22	8.17	3.80	1.73	3.03	7.62	.....
Stateburg, S. C.	4.43	3.29	3.53	3.66	3.97	4.91	1.70	3.29	6.67	0.02	1.18	5.87	42.58
State College, Pa.	3.27	3.56	4.29	1.73	2.37	1.67	3.08	1.65	(°)	(°)	1.66	2.17	.....
Statesville, N. C.	6.06	(°)	12.08	4.40	2.63	7.99	2.96	1.86	0.50	0.92	1.71	5.35	.....
Station Albina, S. A.	(°)	(°)	(°)	(°)	17.18	10.36	10.43	0.70	0.00	0.00	0.99	(°)	.....
Stirling, Kans.	(°)	(°)	(°)	(°)	(°)	(°)	4.75	3.14	(°)	0.82	0.96	1.16	.....
Stockham, Nebr.	0.80	(°)	1.00	5.00	4.10	1.10	5.70	(°)	1.70	2.85	0.10	(°)	88.30
Strafford, Vt.	3.00	4.70	5.20	2.10	4.55	1.60	3.15	3.40	0.70	1.70	4.40	3.80	38.30
Sunman, Ind.	2.00	7.48	2.11	2.40	3.82	2.89	2.65	2.02	5.85	1.04	1.03	3.38	36.67
Sussex, Wis.	(°)	(°)	1.91	3.61	3.11	3.70	5.64	3.14	2.70	3.01	1.97	4.75	.....
Swanwick, Ill.	1.15	6.18	2.75	2.12	4.84	5.66	1.90	1.04	2.85	(°)	(°)	5.78	.....
Swartz Creek, Mich.	1.09	3.00	3.99	2.07	3.17	3.50	5.24	0.95	2.01	4.69	1.91	3.19	34.81
Sycamore, Ill.	0.71	2.15	2.02	4.06	3.18	4.53	8.84	3.43	3.46	5.76	2.48	4.14	44.76
Tamaqua, Pa.	3.73	(°)	(°)	3.29	4.85	3.74	6.96	7.18	1.86	2.24	2.90	7.40	.....
Taunton, Mass.	4.35	4.84	5.33	4.12	2.73	4.04	4.13	5.42	0.53	2.55	3.63	5.31	46.98
Tecumseh, Nebr.	(°)	(°)	(°)	(°)	(°)	4.94	9.03	4.20	0.96	3.03	0.02	0.60	.....
Terre Haute, Ind.	0.89	5.17	2.20	3.68	3.82	5.76	7.11	1.23	4.43	1.59	2.27	5.50	43.05
Thornville, Mich.	1.77	4.08	3.37	1.97	(°)	3.76	4.30	1.47	3.30	5.34	1.50	3.07	.....
Topeka, Kans.	0.65	2.88	3.19	4.88	8.51	5.18	5.37	5.86	6.88	2.87	1.23	1.62	42.63
Traverse City, Mich.	3.19	3.07	2.29	2.12	2.11	2.79	5.78	2.35	4.50	5.74	2.86	5.70	42.50
Troy, Pa.	4.32	2.25	3.85	2.88	4.19	2.63	4.76	3.09	0.77	2.07	2.03	3.28	36.13
Tucson, Ariz.	(°)	(°)	(°)	0.23	0.23	0.32	1.15	0.30	0.24	0.34	4.72	(°)	.....
Variety Mills, Va.	4.49	7.12	8.78	2.21	2.94	5.83	3.96	2.03	0.04	0.96	2.24	4.74	44.84
Vermillion, Dak.	(°)	(°)	1.50	3.42	1.68	(°)	(°)	(°)	(°)	2.18	(°)	0.70	.....
Vevay, Ind.	3.02	10.23	1.37	1.99	5.17	4.20	3.41	0.54	5.33	0.95	1.13	3.83	41.17
Vineland, N. J.	11.56	6.78	6.69	(°)	1.99	(°)	3.86	2.63	0.47	0.80	2.81	6.53	.....
Voluntown, Conn.	5.80	6.30	4.25	2.45	2.90	5.20	6.40	5.90	1.00	0.90	3.10	8.00	53.00
Wabash, Ind.	1.29	4.48	2.05	2.84	4.00	2.23	4.79	2.18	2.39	8.75	1.64	5.54	37.87
Washington City.	5.02	6.15	6.50	1.59	2.34	6.70	3.03	0.58	0.22	1.53	2.33	4.63	44.26
Wausau, Wis.	(°)	(°)	1.20	2.41	1.91	4.03	3.17	4.62	12.03	4.31	1.65	3.70	.....
Wauseon, Ohio	1.93	5.02	2.78	1.42	3.95	2.79	4.20	1.12	1.85	3.01	1.46	3.38	32.91
Webster, Dak.	1.42	7.46	5.30	3.73	9.19	8.01	14.65	6.41	1.48	5.09	0.92	1.52	65.18
Weir's Bridge, N. H.	2.80	4.87	4.63	3.83	(°)	0.80	9.44	4.08	0.95	2.42	3.14	3.67	.....
Weldon, N. C.	5.33	3.36	7.06	1.99	2.91	3.14	7.70	1.86	0.23	1.05	3.00	5.99	41.92
Wellington, Kans.	0.46	0.71	1.05	3.67	4.79	4.21	1.89	3.44	1.10	2.90	1.85	3.14	29.21
Wellsborough, Pa.	8.09	10.18	(°)	2.31	9.36	4.88	8.67	1.95	3.20	3.02	6.61	6.39	.....
Wellsburg, W. Va.	3.60	5.20	3.81	0.90	3.90	1.70	4.03	1.55	1.35	3.20	0.62	(°)	.....
Westborough, Mass.	5.25	7.12	5.11	4.29	3.66	3.75	3.58	(°)	1.13	2.38	2.95	5.49	.....
West Chester, Pa.	7.32	7.29	6.09	2.94	3.64	7.52	5.27	2.12	0.42	2.56	4.36	7.00	56.53
Westerville, Ohio.	1.97	4.62	3.32	1.75	3.53	3.03	1.84	1.08	4.91	1.20	1.08	2.83	31.16
West Leavenworth, Kans.	(°)	(°)	6.30	(°)	15.70	(°)	9.50	5.50	7.00	5.00	1.45	1.93	.....
Westmoreland, N. Y.	(°)	(°)	(°)	4.20	2.88	5.50	8.50	5.75	5.75	(°)	(°)	(°)	.....
White Plains, N. Y.	4.30	4.35	3.31	2.70	8.20	6.40	7.65	6.64	1.12	2.60	3.32	5.05	51.64
Wilkesbarre, Pa.	8.41	3.48	4.95	2.46	3.97	2.68	4.62	2.90	(°)	3.16	3.30	4.53	.....

1 No record.

2 Inappreciable.

*Monthly and annual precipitation, from reports made by voluntary observers of the Signal Service, United States Army—Continued.*

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Williamstown, Mass. ....	1.75	2.76	2.80	1.88	2.51	1.65	( <sup>1</sup> )	( <sup>1</sup> )	0.58	2.98	2.09	2.72	.....
Wilton Centre, Ill. ....	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	2.14	2.31	3.62	5.45	1.48	4.84	.....
Wolfeborough, N. H. ....	4.71	5.64	5.48	3.52	( <sup>1</sup> )	1.69	2.89	4.01	1.28	2.63	3.47	5.05	.....
Woodstock, Md. ....	6.13	6.69	7.65	1.63	3.20	2.74	2.67	1.67	0.23	1.45	4.27	2.15	40.17
Woodstock, N. H. ....	2.69	5.32	5.72	2.26	( <sup>1</sup> )	1.48	2.11	2.84	1.26	4.08	4.35	4.65	.....
Woodstock, Vt. ....	3.22	2.62	4.48	2.31	3.00	1.88	2.96	2.12	( <sup>1</sup> )	2.04	4.35	4.09	.....
Worcester, Mass. ....	5.04	6.23	2.37	4.20	2.50	4.06	4.07	3.73	0.31	2.34	2.27	5.75	42.37
Wyandotte, Kans. ....	( <sup>1</sup> )	2.51	2.66	3.36	3.78	4.71	4.64	5.36	7.10	4.07	1.15	1.54	.....
Wytheville, Va. ....	3.92	5.33	3.04	2.65	3.41	5.92	2.76	1.33	0.60	0.86	1.21	3.02	39.10
Wytheville, Va.* .....	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	1.00	0.60	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	.....
Yates Centre, Kans. ....	0.48	1.04	1.09	3.36	1.35	2.46	2.55	1.51	5.63	3.33	1.62	2.26	28.88
Yutan, Nebr. ....	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	9.19	5.22	5.06	4.66	0.02	( <sup>1</sup> )	.....

<sup>1</sup> No record.

\* Three and one-half miles from.

## APPENDIX 32.

Monthly and annual precipitation at military post hospitals for the year ending December 31, 1884.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Abraham Lincoln, Fort, Dak.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Alcatraz Island, Cal.	1.00	0.68	0.72	1.88	2.00	5.16	3.80	4.18	2.30	1.20	0.80	1.60	25.82
Angel Island, Cal.	8.10	3.96	6.02	7.34	0.20	2.11	0.01	0.25	0.30	0.97	0.05	4.50	28.81
Assinaboine, Fort, Mont.	4.05	6.85	7.82	6.67	0.12	2.66	( <sup>1</sup> )	0.06	0.25	2.71	0.35	7.85	39.39
Barrancas, Fort, Fla.	0.16	0.42	0.53	0.25	3.05	3.95	0.00	2.59	2.74	0.41	0.42	0.78	15.80
Benicia Barracks, Cal.	7.06	3.40	6.25	6.95	9.75	11.99	11.80	2.89	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	2.48	...
Bidwell, Fort, Cal.	8.61	4.57	7.93	4.16	0.10	2.47	0.00	0.03	0.15	1.07	0.01	7.19	31.29
Brady, Fort, Mich.	1.14	2.96	6.57	0.68	0.40	4.29	0.67	0.08	1.55	0.73	( <sup>2</sup> )	6.38	25.45
Bridger, Fort, Wyo.	0.73	1.22	0.66	1.27	2.73	1.43	3.14	4.29	7.00	4.35	1.25	3.32	31.42
Brown, Fort, Tex.	0.36	0.48	0.38	0.37	1.00	0.10	0.50	2.90	0.74	0.13	0.03	0.25	7.24
Buford, Fort, Dak.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	0.08	0.48	7.50	10.17	1.18	0.80	...
Columbus, Fort, N. Y. H.	0.11	0.12	0.10	0.82	0.14	0.24	1.94	0.25	0.18	0.12	1.32	2.04	7.38
Concho, Fort, Tex.	5.46	5.05	4.52	( <sup>1</sup> )	4.12	5.45	7.20	8.72	0.22	3.36	3.02	4.44	...
David's Island, N. Y.	0.40	0.80	0.50	4.30	9.83	1.77	2.20	0.96	3.64	4.16	1.50	6.85	36.21
Ellis, Fort, Mont.	3.59	3.80	3.29	1.85	3.42	3.78	2.93	5.06	0.33	4.45	2.80	6.02	39.85
Fred Steele, Fort, Wyo.	3.25	0.75	0.32	1.31	2.88	3.50	2.48	1.10	4.65	1.38	0.00	1.80	22.02
Gaston, Fort, Cal.	( <sup>1</sup> )	( <sup>1</sup> )	1.30	0.96	2.82	0.30	0.14	0.70	0.24	0.68	0.16	1.10	...
Hamilton, Fort, N. Y. H.	5.49	5.16	7.80	6.89	1.30	1.50	0.12	0.00	2.28	1.08	0.54	14.40	45.95
Keogh, Fort, Mont.	7.53	6.06	4.22	3.16	4.49	4.75	8.65	10.04	0.46	3.41	8.01	5.40	56.18
Klamath, Fort, Oreg.	( <sup>1</sup> )	0.37	0.30	1.20	( <sup>1</sup> )	( <sup>1</sup> )	2.62	1.76	0.46	0.14	0.26	0.24	...
Lewis, Fort, Colo.	2.68	1.88	3.02	1.76	0.74	3.14	0.34	0.03	0.88	1.22	( <sup>1</sup> )	3.40	...
Lyon, Fort, Colo.	0.25	3.41	4.24	( <sup>1</sup> )	1.08	1.34	2.24	2.86	1.15	2.10	( <sup>1</sup> )	4.30	...
Madison Barracks, N. Y.	( <sup>1</sup> )	( <sup>1</sup> )	0.40	1.10	3.11	1.60	2.20	1.70	0.20	0.78	0.20	0.10	...
Mason, Fort, Cal.	2.86	2.37	2.45	0.54	3.25	0.99	8.98	( <sup>1</sup> )	2.69	2.63	2.49	2.68	...
McDermitt, Fort, Nev.	3.90	3.34	5.94	4.34	( <sup>2</sup> )	2.00	0.00	0.00	( <sup>2</sup> )	0.94	1.14	5.80	27.40
McDowell, Fort, Ariz.	6.72	4.80	4.88	4.52	3.20	4.44	1.20	( <sup>1</sup> )	1.69	1.05	0.00	1.88	84.88
McHenry, Fort, Md.	0.14	4.37	3.47	0.06	0.45	0.69	( <sup>2</sup> )	1.18	3.10	( <sup>1</sup> )	0.48	4.14	...
Meade, Fort, Dak.	5.88	5.89	5.42	1.86	2.49	2.04	7.80	1.62	( <sup>2</sup> )	0.98	3.91	3.90	42.29
Mojave, Fort, Ariz.	0.37	0.33	2.26	5.04	8.58	0.48	1.20	2.30	0.23	0.75	0.53	0.90	22.97
Monroe, Fort, Va.	0.00	1.90	( <sup>1</sup> )	0.67	0.29	6.00	( <sup>2</sup> )	0.00	0.00	0.07	0.00	5.69	...
Mount Vernon Barracks, Ala.	5.10	3.56	6.58	1.42	1.53	3.99	( <sup>1</sup> )	3.12	0.16	0.20	0.58	3.02	...
Niagara, Fort, N. Y.	5.45	4.76	14.68	5.61	5.79	7.75	5.61	4.98	1.15	5.76	4.73	3.10	69.37
Pembina, Fort, Dak.	2.25	2.75	2.27	0.71	( <sup>1</sup> )	1.16	1.51	0.55	0.70	0.85	9.77	1.76	...
Plattsburg Barracks, N. Y.	0.10	0.80	1.81	1.86	1.25	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	2.25	2.62	...
Presidio, Cal.	1.88	1.84	3.49	1.08	2.29	1.60	1.98	2.19	1.69	2.42	2.03	1.26	23.75
Randall, Fort, Dak.	8.64	4.12	5.86	5.10	0.14	1.93	( <sup>1</sup> )	0.00	0.30	2.18	0.19	( <sup>1</sup> )	...
Reno, Fort, Ind. T.	0.58	0.47	2.98	2.80	1.70	4.31	2.32	2.39	0.04	0.97	0.04	1.08	19.68
Robinson, Fort, Nebr.	0.48	0.18	( <sup>1</sup> )	3.64	6.79	4.44	2.21	3.22	8.91	4.66	3.38	2.50	...
Saint Augustine, Fla.	0.40	0.50	( <sup>1</sup> )	1.49	2.85	1.53	2.25	1.00	0.50	0.34	0.15	( <sup>1</sup> )	...
Shaw, Fort, Mont.	1.67	3.42	1.92	2.14	1.73	7.43	3.54	10.02	1.71	1.05	3.87	1.87	40.87
Sisseton, Fort, Dak.	0.33	0.82	0.41	0.59	0.74	0.97	2.68	0.59	2.39	0.39	0.84	( <sup>1</sup> )	...
Snelling, Fort, Minn.	0.35	0.82	0.82	1.26	3.00	1.32	3.45	4.27	1.43	3.63	0.52	1.31	22.18
Spokane, Fort, Wash.	( <sup>1</sup> )	1.34	0.86	1.88	2.42	5.42	2.10	3.61	5.51	2.37	0.45	1.41	...
Sully, Fort, Dak.	0.90	1.02	0.42	1.30	( <sup>2</sup> )	1.52	0.82	0.20	1.56	1.18	( <sup>1</sup> )	( <sup>1</sup> )	...
Totten, Fort, Dak.	0.29	0.47	0.87	2.28	2.04	3.00	2.57	0.72	0.76	1.04	0.17	0.63	14.84
Townsend, Fort, Wash.	0.66	0.54	0.98	2.90	0.98	1.89	1.92	5.94	1.98	0.98	0.25	0.68	19.67
Union, Fort, N. Mex.	2.36	1.77	0.11	2.10	0.97	2.23	0.86	2.02	2.04	2.14	0.39	1.57	18.56
West Point, N. Y.	0.18	0.54	0.28	0.28	4.93	8.06	0.76	7.80	1.08	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	...
Wingate, Fort, N. Mex.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>2</sup> )	3.30	2.50	8.40	( <sup>1</sup> )	1.00	( <sup>1</sup> )	5.00	6.20	...
Yates, Fort, Dak.	( <sup>1</sup> )	0.50	( <sup>1</sup> )	( <sup>2</sup> )	1.04	1.18	1.78	4.64	0.70	1.66	( <sup>2</sup> )	0.74	...
	0.23	0.35	0.29	1.50	0.94	5.00	3.80	4.90	1.94	0.39	0.54	0.50	20.38

<sup>1</sup>No record.<sup>2</sup>Inappreciable.

## APPENDIX 33.

*Monthly and annual precipitation at stations on the Central Pacific and Southern Pacific Railroads and connecting branches for the year ending December 31, 1884.*

[Copied from the records on file at the office of the chief engineer C. P. R. R.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Alta, Cal.	3.50	8.60	( <sup>2</sup> )	5.20	0.50	3.00	0.00	0.00	0.12	1.00	0.00	14.08	
Anaheim, Cal.	2.80	10.58	6.70	1.75	0.54	1.28	0.00	0.00	0.00	0.15	0.64	3.72	28.16
Antioch, Cal.	3.50	3.64	5.73	2.62	0.00	1.15	0.00	( <sup>2</sup> )	( <sup>2</sup> )	1.25	( <sup>2</sup> )	2.89	20.78
Aptos, Cal.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	0.00	( <sup>1</sup> )	1.65	0.00	11.34	
Auburn, Cal.	5.33	7.69	10.17	8.02	0.85	1.23	0.00	0.00	0.56	2.25	0.00	16.37	52.41
Battle Mountain, Nev.	0.70	0.23	1.04	1.54	1.29	2.18	0.00	0.10	1.12	1.94	0.00	1.82	11.96
Benson, Ariz.	0.20	0.63	1.20	( <sup>2</sup> )	0.00	( <sup>1</sup> )	0.70	0.27	0.30	2.89	( <sup>1</sup> )	2.50	
Beowawe, Nev.	0.75	1.60	0.96	0.77	1.29	2.25	0.00	0.00	0.93	0.58	0.00	1.84	10.97
Bishop Creek, Nev.	( <sup>1</sup> )	( <sup>1</sup> )	0.94	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	
Blue Creek, Utah	1.14	0.70	( <sup>1</sup> )	2.16	1.01	0.52	0.00	0.00	1.80	0.50	0.10	2.50	
Boca, Cal.	4.60	6.30	5.10	1.90	0.30	1.40	0.00	0.00	0.00	0.50	0.00	8.20	28.60
Borden, Cal.	1.99	4.48	3.29	2.47	1.77	1.73	0.00	0.00	0.00	0.16	0.00	4.74	20.63
Brentwood, Cal.	2.62	3.84	4.18	2.22	( <sup>2</sup> )	1.51	0.00	0.00	( <sup>2</sup> )	1.20	0.00	2.69	18.26
Brighton, Cal.	2.08	3.68	5.32	3.54	0.25	1.55	0.00	0.00	0.23	1.42	0.00	6.17	24.24
Brown's, Nev.	0.56	0.68	0.36	0.72	0.11	0.49	0.15	0.00	0.06	1.36	0.00	0.51	5.00
Byron, Cal.	2.41	4.15	5.61	2.50	0.00	1.54	0.00	0.00	0.00	1.28	0.00	3.83	20.77
Cabazon, Cal.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	0.00	0.00	0.00	0.00	2.05	
Caliente, Cal.	2.00	4.98	5.00	2.90	1.10	1.28	0.00	0.00	0.00	0.22	0.25	8.25	20.98
Calistoga, Cal.	6.57	4.42	9.78	6.98	0.42	2.06	0.00	0.00	0.19	1.83	0.05	15.08	46.38
Carlin, Nev.	1.20	1.79	1.82	1.42	1.58	1.85	0.07	0.28	0.74	1.37	0.00	2.89	14.99
Casa Grande, Ariz.	0.75	( <sup>1</sup> )	1.08	0.00	0.00	( <sup>1</sup> )	0.00	2.87	0.00	1.31	0.00	3.20	
Chico, Cal.	2.48	2.16	5.57	2.93	0.40	2.11	0.00	0.00	0.88	1.40	0.00	5.28	23.19
Chualar, Cal.	1.72	( <sup>1</sup> )	5.17	2.73	( <sup>2</sup> )	1.78	0.06	( <sup>1</sup> )	0.07	2.08	0.24	3.79	
Cinco, Cal.	8.40	12.00	14.65	10.10	0.00	3.54	0.00	0.00	0.00	0.22	0.00	25.05	76.06
Colfax, Cal.	10.94	9.73	12.27	10.94	1.38	3.01	0.00	( <sup>2</sup> )	0.80	2.55	( <sup>2</sup> )	23.60	71.82
Colton, Cal.	1.00	11.38	4.05	2.85	2.90	0.82	0.60	0.25	0.00	0.25	0.12	3.93	27.05
Corinne, Utah	0.55	1.90	3.80	2.10	1.75	0.70	0.20	0.30	2.90	1.05	0.05	3.65	18.95
Daggett, Cal.	0.48	1.44	1.17	0.10	0.49	0.00	0.00	0.00	( <sup>2</sup> )				
Davisville, Cal.	3.07	3.78	5.09	3.07	0.00	1.39	0.00	0.00	0.28	1.48	0.00	5.25	23.41
Delano, Cal.	1.61	2.38	1.98	2.31	( <sup>2</sup> )	0.22	0.00	0.00	0.00	0.00	0.16	2.16	
Delta, Cal.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	0.01	0.56	16.14	
Deming, N. Mex.	0.81	0.70	0.20	0.20	0.00	0.00	0.52	1.04	0.80	1.53	( <sup>1</sup> )	1.35	
Dunnigan, Cal.	3.26	3.21	5.78	2.78	( <sup>2</sup> )	2.59	0.00	0.00	0.04	1.28	0.00	7.16	26.10
Elko, Nev.	1.20	1.00	1.40	0.72	0.65	1.27	( <sup>1</sup> )	0.00	1.00	0.59	0.00	3.41	
El Paso, Tex.	0.25	0.20	0.12	0.07	0.00	( <sup>1</sup> )	0.00	1.56	( <sup>1</sup> )	( <sup>1</sup> )	0.05	0.57	
Emigrant Gap, Cal.	8.22	10.20	15.18	10.84	2.10	2.77	0.00	0.00	0.51	1.93	0.00	31.20	82.95
Farmington, Cal.	1.44	5.04	6.53	4.72	0.35	1.32	0.00	0.00	0.09	1.15	0.00	6.21	26.85
Fenner, Cal.	0.15	1.30	1.25	0.15	1.09	0.05	0.00	( <sup>1</sup> )	0.00	( <sup>1</sup> )	0.00		
Fresno City, Cal.	2.29	3.18	2.81	2.85	1.11	1.29	0.00	( <sup>1</sup> )	0.00	0.35	0.08	3.98	
Galt, Cal.	1.70	4.09	5.46	2.09	0.58	1.36	0.00	0.00	0.00	1.31	0.00	6.08	22.65
Gilroy, Cal.	2.94	6.65	7.24	3.80	0.34	1.24	0.00	0.11	0.12	1.73	0.06	8.03	33.06
Golconda, Nev.	0.69	0.78	1.81	1.91	1.51	( <sup>1</sup> )	0.00	0.10	0.57	0.44	0.00	1.12	
Goshen, Cal.	1.56	3.80	1.71	1.97	0.54	( <sup>1</sup> )	0.00	0.00	0.00	0.36	0.00	3.75	
Halleck, Nev.	0.60	0.72	1.99	1.80	1.03	0.56	0.03	0.14	( <sup>1</sup> )	0.30	0.00	1.33	
Hawthorne, Nev.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	0.18	0.69	0.89	0.00	0.10	0.00	0.05	0.00	0.52	
Hollister, Cal.	1.05	3.80	4.38	2.66	0.62	1.85	0.00	0.05	0.00	1.80	0.00	3.62	19.33
Hot Springs, Nev.	0.70	0.80	( <sup>1</sup> )	0.44	0.29	1.28	0.04	0.08	0.00	0.33	0.00	0.50	
Humboldt, Nev.	1.20	0.75	0.39	0.51	0.00	( <sup>1</sup> )	0.00	( <sup>1</sup> )	0.00	1.28	0.00	0.51	
Indio, Cal.	0.00	3.16	0.62	0.44	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.68
Ione, Cal.	2.81	6.13	7.87	6.51	0.39	2.03	0.00	0.00	0.00	1.82	0.00	8.22	35.78
Kesler, Cal.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	0.20	1.60	0.80	0.00	0.20	0.00	0.00	0.00	0.70	
Keene, Cal.	2.14	7.46	4.80	3.16	3.23	1.79	0.00	0.00	( <sup>2</sup> )	2.55	0.36	5.22	30.71
Kelton, Utah	0.05	0.72	2.20	1.80	0.81	0.35	0.15	0.34	1.97	( <sup>1</sup> )	0.00	8.35	
Kingsburg, Cal.	2.47	4.09	4.09	2.17	1.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	16.85
Knight's Landing, Cal.	3.68	3.53	4.88	3.15	0.00	1.89	0.00	( <sup>1</sup> )	0.35	1.45	0.00	5.56	
Lathrop, Cal.	1.14	4.17	4.80	2.57	0.36	1.02	0.00	( <sup>1</sup> )	0.10	0.82	0.00	2.97	
Lemoore, Cal.	3.50	3.21	3.40	3.25	0.40	1.49	0.00	0.00	( <sup>1</sup> )	0.25	0.20	3.87	
Livermore, Cal.	4.03	5.29	5.92	2.70	0.20	1.73	0.00	0.10	0.30	1.14	0.02	6.22	27.65
Lordsburg, N. Mex.	0.80	0.13	2.10	0.20	( <sup>2</sup> )	0.00	0.20	1.30	2.35	2.55	0.00	1.46	13.09
Los Angeles, Cal.	3.02	10.74	9.85	3.15	0.70	1.30	0.00	0.00	0.00	0.30	0.85	4.21	34.12
Mammoth Tank, Cal.	( <sup>2</sup> )	1.36	0.22	0.07	0.19	0.00	0.00	( <sup>2</sup> )	0.00	0.00	0.00	0.87	2.71

<sup>1</sup> No record.

<sup>2</sup> Record incomplete.

<sup>3</sup> Inappreciable.

<sup>4</sup> Observations discontinued.



*Monthly and annual precipitation at stations on the Central Pacific and Southern Pacific Railroads, &c.—Continued.*

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Maricopa, Ariz.....	1.05	8.58	2.20	0.10	0.00	( <sup>1</sup> )	( <sup>1</sup> )	0.00	0.40	8.43	0.08	2.08	
Martinez, Cal.....	3.57	4.65	7.97	8.17	0.00	2.00	0.00	0.13	0.13	1.13	0.00	4.76	27.38
Marysville, Cal.....	2.49	2.82	3.31	2.57	0.00	1.18	0.00	0.00	0.09	1.74	0.00	4.24	18.44
Menlo Park, Cal.....	3.35	4.07	4.80	2.76	0.00	3.16	0.00	0.05	0.04	( <sup>1</sup> )	0.27	4.92	
Merced, Cal.....	1.64	4.39	5.88	5.00	0.86	1.73	0.00	0.00	0.00	0.54	0.02	3.63	23.79
Modesto, Cal.....	0.75	2.01	3.89	2.85	0.15	0.99	0.00	( <sup>1</sup> )	0.00	1.20	0.00	2.62	
Mojave, Cal.....	1.77	7.67	2.17	( <sup>2</sup> )	0.00	0.00	0.00	0.10	( <sup>1</sup> )	0.13	( <sup>1</sup> )	( <sup>1</sup> )	
Monterey, Cal.....	2.60	4.34	6.08	3.75	0.86	1.80	0.00	0.07	0.03	1.61	0.30	5.33	26.47
Napa City, Cal.....	3.02	3.89	5.72	0.00	0.13	2.12	0.00	0.00	( <sup>1</sup> )	0.70	0.00	10.10	
Needles, Ariz.....	0.00	1.86	2.08	0.10	0.75	0.00	0.00	0.00	0.00	( <sup>4</sup> )			
Newhall, Cal.....	6.66	14.53	9.73	8.85	2.17	1.67	0.00	0.00	0.00	0.60	1.10	3.89	44.20
Niles, Cal.....	3.78	6.18	5.41	3.74	0.18	2.69	0.00	0.00	0.34	1.30	0.00	5.75	29.37
Oakland, Cal.....	2.93	4.46	8.18	4.58	0.30	2.83	0.00	0.00	0.20	2.77	0.00	6.10	32.35
Ogden, Utah.....	0.77	2.21	3.63	3.85	1.51	0.61	0.00	0.08	2.41	1.46	0.00	2.96	19.49
Orland, Cal.....	2.38	1.58	4.81	2.97	0.23	2.55	0.00	0.00	0.20	0.80	0.00	4.03	20.05
Otego, Nev.....	1.05	0.85	1.20	1.91	1.26	1.21	0.04	0.60	0.42	1.03	0.00	3.15	12.72
Pajaro, Cal.....	2.68	6.33	5.83	8.61	0.32	1.47	0.00	0.15	0.18	1.92	0.20	7.45	30.14
Palisade, Nev.....	0.88	1.00	2.17	1.50	1.80	1.72	0.05	0.22	1.09	1.60	0.00	2.07	13.10
Pantano, Ariz.....	0.31	1.64	0.63	0.00	0.33	( <sup>1</sup> )	0.40	2.60	1.45	2.80	0.85	4.70	
Petaluma, Cal.....	4.85	3.96	4.86	5.53	0.31	2.80	0.00	0.02	0.13	( <sup>1</sup> )	0.12	8.07	
Pleasanton, Cal.....	3.41	6.18	6.53	3.14	0.05	1.78	0.00	0.09	0.08	0.99	0.00	4.47	26.72
Promontory, Utah.....	0.90	1.75	1.08	4.37	1.42	1.02	0.00	0.00	2.17	0.56	( <sup>1</sup> )	1.40	
Ravenna, Cal.....	4.58	9.50	6.06	2.15	0.20	1.65	0.00	0.25	0.10	0.30	0.80	3.00	23.50
Red Bluff, Cal.....	3.78	2.60	7.99	4.36	0.25	1.24	0.00	0.00	0.20	1.00	0.00	8.00	29.37
Redding, Cal.....	5.45	3.94	( <sup>1</sup> )	2.65	0.00	0.00	0.00	( <sup>1</sup> )	0.02	1.36	0.00	14.51	
Reno, Nev.....	1.70	1.25	1.80	0.35	0.00	0.80	0.00	0.00	0.00	0.00	0.00	0.77	6.17
Rocklin, Cal.....	3.27	4.56	5.77	4.19	0.00	1.20	0.00	0.00	( <sup>1</sup> )	1.85	( <sup>1</sup> )	7.75	
Sacramento, Cal.....	2.71	2.85	6.50	3.60	0.00	1.35	0.00	( <sup>2</sup> )	0.48	1.80	0.00	7.49	27.69
Salinas, Cal.....	1.52	4.63	4.69	2.87	0.71	2.54	0.00	0.09	0.14	1.81	0.18	4.28	23.46
San Fernando, Cal.....	3.00	10.60	10.51	3.43	1.05	( <sup>1</sup> )	0.00	0.00	0.00	0.42	( <sup>1</sup> )	4.96	
San Jose, Cal.....	3.18	3.85	6.23	3.38	0.05	2.15	0.00	0.00	0.08	( <sup>1</sup> )	0.06	3.90	
San Mateo, Cal.....	3.40	4.88	6.38	3.40	0.05	2.91	0.00	0.00	0.17	1.78	0.21	7.59	
San Simon, Ariz.....	0.40	0.60	2.21	0.00	0.34	0.06	1.21	2.47	0.40	1.63	0.00	1.08	10.37
Santa Cruz, Cal.....	3.30	5.27	3.76	6.78	0.11	2.48	0.00	0.10	0.33	1.37	0.32	8.91	37.73
Soledad, Cal.....	2.74	4.24	3.74	1.07	1.13	1.56	0.00	0.10	0.00	1.78	0.30	1.74	19.00
South Vallejo, Cal.....	2.52	3.21	6.06	3.14	0.00	1.71	0.00	0.00	( <sup>2</sup> )	1.09	0.00	6.03	
Spadra, Cal.....	2.90	3.80	7.00	2.25	0.55	0.75	0.00	0.00	( <sup>2</sup> )	0.00	0.81	2.82	25.88
Stockton, Cal.....	1.68	4.02	5.77	2.65	0.31	1.05	0.00	0.00	( <sup>1</sup> )	1.58	0.00	5.49	
Suisun City, Cal.....	2.64	4.48	6.53	3.78	0.30	1.69	0.00	( <sup>1</sup> )	( <sup>1</sup> )	0.70	0.00	7.46	
Summit, Cal.....	7.00	12.70	9.10	12.60	0.80	4.04	0.00	0.00	0.00	3.18	0.00	9.40	59.37
Sumner, Cal.....	1.48	2.20	1.08	1.27	1.74	0.80	0.00	0.00	0.00	0.00	0.40	3.36	12.40
Tecoma, Nev.....	0.10	0.87	0.93	2.16	1.10	0.50	0.10	0.10	1.83	0.88	( <sup>1</sup> )	1.69	
Tehama, Cal.....	3.15	2.08	4.94	2.61	( <sup>1</sup> )	1.55	0.00	0.00	0.00	0.69	0.00	( <sup>2</sup> )	
Tehichipa, Cal.....	1.54	7.28	3.46	1.85	1.26	1.05	0.00	0.64	0.00	0.13	0.29	2.76	20.24
Tennant, Cal.....	5.23	5.96	10.09	4.19	0.14	1.42	0.00	0.22	0.27	1.76	0.12	8.11	37.51
Terrace, Utah.....	0.70	0.90	1.58	1.74	1.02	0.46	0.03	0.05	1.61	( <sup>1</sup> )	0.00	1.85	
Texas Hill, Ariz.....	0.22	1.81	1.75	0.23	0.28	0.00	( <sup>1</sup> )	0.00	0.02	0.00	0.00	1.31	
Toano, Nev.....	0.70	0.78	0.68	1.87	1.60	0.55	0.00	0.13	0.80	1.25	0.00	2.20	10.56
Tracy, Cal.....	0.90	3.43	3.27	1.65	0.10	2.05	0.00	0.10	0.00	0.82	0.00	2.49	14.81
Truckee, Cal.....	6.65	11.30	5.36	3.90	0.06	1.02	0.00	0.00	( <sup>1</sup> )	1.50	0.00	18.24	
Tucson, Ariz.....	0.08	3.30	0.14	0.20	0.00	0.10	0.65	0.70	0.45	1.50	0.70	3.90	4.72
Tulare, Cal.....	1.16	2.97	2.64	1.97	0.48	1.02	0.00	0.00	0.00	0.16	0.08	2.61	13.09
Turlock, Cal.....	1.47	2.94	2.00	2.20	0.73	1.98	0.00	0.00	0.08	0.85	0.00	2.46	14.66
Wadsworth, Nev.....	0.25	0.50	0.98	0.00	0.27	1.40	0.05	0.02	0.05	0.00	0.00	0.85	4.37
Wells, Nev.....	0.70	0.70	1.17	1.14	1.48	1.57	0.00	0.17	0.28	2.80	0.00	1.80	11.76
Wilcox, Ariz.....	0.64	2.44	1.86	0.02	0.07	0.11	1.25	1.88	( <sup>2</sup> )	3.49	0.21	2.99	14.46
Williams, Cal.....	3.01	1.58	3.98	1.96	( <sup>2</sup> )	2.96	0.00	0.00	0.33	0.45	0.00	4.27	18.44
Willow, Cal.....	5.42	3.11	4.80	2.58	0.12	0.90	0.00	0.00	0.13	0.69	0.00	4.18	21.93
Winnemucca, Nev.....	1.05	1.00	5.28	1.53	2.19	1.83	0.33	0.00	0.00	1.92	0.00	5.82	20.90
Woodland, Cal.....	3.47	3.44	4.69	3.88	0.00	( <sup>1</sup> )	0.00	0.00	( <sup>2</sup> )	( <sup>1</sup> )	0.00	4.63	
Yuma, Ariz.....	( <sup>2</sup> )	1.11	1.48	0.07	0.27	( <sup>1</sup> )	0.00	( <sup>2</sup> )	( <sup>1</sup> )	0.00	0.00	1.91	

<sup>1</sup> No record.<sup>2</sup> Record incomplete.<sup>3</sup> Inappreciable.<sup>4</sup> Observations discontinued.

## APPENDIX 34.

*Precipitation at the cotton-region stations of the Signal Service, United States Army, for the months July to October, 1884, inclusive, and May and June, 1885.*

Stations.	1884.				1885.	
	July.	August.	September.	October.	May.	June.
Wilmington, N. C.:	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>
Charlotte, N. C. ....	7.82	2.16	8.57	1.51	6.48	3.48
Cheraw, S. C. ....	8.34	2.97	8.51	0.28	5.53	4.98
Florence, S. C. ....	9.61	1.78	5.41	0.12	4.71	5.04
Goldsbrough, N. C. ....	3.98	4.28	2.53	0.88	5.87	5.31
Lumberton, N. C. ....	4.47	5.81	6.08	0.11	6.46	7.67
New Bern, N. C. ....	3.57	7.38	3.18	0.41	10.86	5.17
Raleigh, N. C. ....	3.82	3.57	0.78	0.69	7.00	0.09
Salisbury, N. C. ....	1.85	1.07	0.26	0.97	6.35	8.60
Wadesborough, N. C. ....	7.93	1.45	1.50	0.25	3.97	1.78
Weldon, N. C. ....	7.97	2.32	0.08	1.21	8.59	1.85
Wilmington, N. C. ....	3.73	9.06	9.85	0.03	8.58	8.20
Charleston, S. C.:						
Branchville, S. C. ....	5.21	5.07	4.27	0.03	1.03	5.47
Charleston, S. C. ....	9.34	6.80	11.03	0.35	2.20	5.96
Hardeeville, S. C. ....	4.08	9.34	5.65	0.20	4.73	12.95
Jacksonborough, S. C. ....	11.28	8.46	2.13	0.45	3.08	5.95
Kingston, S. C. ....	6.63	5.01	6.56	0.03	5.86	5.64
Saint George's, S. C. ....	8.52	3.42	5.44	0.00	3.78	4.85
Saint Matthew's, S. C. ....	4.79	4.10	4.93	0.00	4.51	5.57
Yemassee, S. C. ....	6.88	6.61	6.01	0.22	5.67	6.20
Augusta, Ga.:						
Allendale, S. C. ....	3.97	5.49	4.19	0.00	5.77	4.12
Athens, Ga. ....	7.02	2.84	0.00	0.52	6.96	4.01
Augusta, Ga. ....	3.41	4.35	4.23	0.83	5.87	2.80
Batesburg, S. C. ....	4.45	5.14	5.09	0.00	4.59	5.29
Blackville, S. C. ....	3.99	4.38	6.49	0.27	2.64	7.20
Camak, Ga. ....	2.62	2.04	0.64	0.27	6.04	5.23
Chester, S. C. ....	1.40	0.42	3.25	0.00	1.71	2.46
Columbia, S. C. ....	2.48	3.53	5.09	0.00	9.21	4.90
Greenwood, S. C. ....	5.82	4.65	1.40	0.24	4.09	4.18
Union Point, Ga. ....					3.65	2.47
Washington, Ga. ....	2.81	1.26	0.70	1.48	8.42	4.33
Waynesborough, Ga. ....	2.80	4.68	3.15	0.00	4.79	3.49
Savannah, Ga.:						
Albany, Ga. ....	8.57	3.75	0.88	0.00	5.07	3.32
Allapaha, Ga. ....	6.28	6.74	1.30	0.00	4.09	1.74
Bainbridge, Ga. ....	0.84	0.35	0.15	0.00	0.44	0.31
Cedar Keys, Fla. ....	6.02	8.11	3.63	0.13	3.48	10.98
Eastman, Ga. ....	( <sup>1</sup> )	1.47	( <sup>1</sup> )	<sup>20</sup> 0.00	0.19	0.15
Fernandina, Fla. ....	5.00	7.02	( <sup>1</sup> )	1.00	5.21	3.97
Fort Gaines, Ga. ....	4.68	3.39	0.34	0.00	3.21	2.21
Jessup, Ga. ....	5.62	7.86	2.92	1.00	3.48	8.00
Live Oak, Fla. ....	3.77	3.72	0.50	0.27	5.58	0.97
Millen, Ga. ....	5.77	3.12	3.18	0.07	3.12	4.86
Quitman, Ga. ....	3.66	1.68	2.35	0.76	4.60	1.66
Savannah, Ga. ....	3.74	<sup>28</sup> 8.46	<sup>4</sup> 5.55	<sup>2</sup> 2.29	3.98	8.10
Smithville, Ga. ....	1.85	2.00	0.44	0.00	4.64	2.38
Thomasville, Ga. ....	5.14	2.05	1.05	0.22	3.08	6.15
Waldo, Fla. ....	0.74	4.93	( <sup>1</sup> )	1.12	6.30	1.39
Way Cross, Ga. ....	4.86	10.12	2.00	0.70	5.15	4.35
Atlanta, Ga.:						
Anderson, S. O. ....	2.68	1.92	0.06	0.78	2.35	3.74
Atlanta, Ga. ....	2.46	2.08	0.08	0.70	6.21	4.83
Cartersville, Ga. ....	4.80	1.28	1.82	0.77	6.06	3.61
Columbus, Ga. ....	5.22	1.43	( <sup>1</sup> )	0.03	6.01	3.83
Dalton, Ga. ....	6.51	1.79	1.37	0.93	7.25	6.16
Gainesville, Ga. ....	4.94	0.52	1.18	0.10	4.04	2.81
Greenville, S. C. ....	7.25	1.42	0.00	0.10	4.16	4.87
Griffin, Ga. ....	3.45	3.79	1.11	0.68	6.88	3.09

<sup>1</sup> No record.<sup>2</sup> 26 days only.<sup>3</sup> 23 days only.

Precipitation at the cotton-region stations of the Signal Service, &amp;c.—Continued.

Stations.	1884.				1885.	
	July.	August.	September.	October.	May.	June.
<b>Atlanta, Ga.—Continued:</b>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>
Macon, Ga. ....	4.03	1.97	0.13	0.32	5.18	3.85
Newnan, Ga. ....	3.54	2.74	0.11	0.52	6.69	3.29
Spartanburg, S. C. ....	3.83	1.61	0.75	0.06	4.83	3.69
Toccoa, Ga. ....	5.66	2.14	1.12	0.40	8.01	1.75
West Point, Ga. ....	3.23	4.11	0.06	0.60	4.59	5.83
<b>Montgomery, Ala.:</b>						
Birmingham, Ala. ....	5.29	1.74	0.10	1.01	6.48	3.49
Calera, Ala. ....	2.08	3.04	0.00	0.15	5.21	4.40
Enfauia, Ala. ....	8.98	3.88	0.14	0.03	3.02	1.06
Fort Deposit, Ala. ....	0.34	0.66	0.00	0.12	5.08	2.60
Greenville, Ala. ....	<sup>(1)</sup>	2.78	0.25	1.03	14.45	9.16
Marion, Ala. ....	8.91	4.33	0.00	1.90	3.03	1.07
Montgomery, Ala. ....	3.10	3.05	0.58	1.87	8.92	4.12
Opelika, Ala. ....	5.88	1.47	0.29	0.56	7.13	3.33
Pine Apple, Ala. ....	3.88	3.25	0.60	1.09	3.95	2.68
Selma, Ala. ....	7.21	2.28	0.00	2.93	2.64	1.13
<b>Mobile, Ala.:</b>						
Aberdeen, Miss. ....	4.91	0.78	2.93	0.60	4.82	2.44
Columbus, Miss. ....	10.20	0.88	0.42	0.81	6.44	4.50
Evergreen, Ala. ....	7.53	2.87	<sup>(1)</sup>	1.75	<sup>(1)</sup>	<sup>(1)</sup>
Livingston, Ala. ....	5.77	4.89	0.43	<sup>21.25</sup>	<sup>3.68</sup>	<sup>(1)</sup>
Macon, Miss. ....	5.12	1.25	0.40	0.50	7.31	0.15
Meridian, Miss. ....	0.03	0.15	0.01	0.13	<sup>(1)</sup>	<sup>(1)</sup>
Mobile, Ala. ....	4.96	1.26	1.78	5.36	3.27	4.15
Okalona, Miss. ....	6.90	1.30	0.06	0.90	5.23	2.50
Waynesborough, Miss. ....	6.98	2.46	0.55	2.05	3.13	2.50
<b>New Orleans, La.:</b>						
Alexandria, La. ....	4.71	0.62	4.70	3.45	3.56	2.56
Amite City, La. ....	1.13	3.52	0.94	5.02	0.09	0.11
Brookhaven, Miss. ....	0.48	4.18	2.28	1.73	0.84	4.07
Cheneyville, La. ....	1.45	1.06	3.17	3.25	2.88	3.62
Conshatta Chute, La. ....	1.96	1.68	1.81	2.10	2.86	3.82
Hazlehurst, Miss. ....	0.14	0.53	0.06	0.15	0.11	0.37
Lafayette, La. ....	4.57	1.39	2.55	4.10	5.84	4.11
Minden, La. ....	1.24	2.27	1.76	1.02	2.41	2.70
Natchez, Miss. ....	0.62	3.87	2.87	2.98	3.52	1.89
Natchitoches, La. ....	0.00	2.30	2.45	1.90	3.87	2.38
New Orleans, La. ....	4.12	0.87	3.12	5.60	5.77	3.30
Opelousas, La. ....	3.99	0.55	2.11	2.59	4.77	4.22
Shreveport, La. ....	0.06	1.99	2.10	0.53	3.70	5.77
Whiteville, La. ....	1.87	1.69	2.22	6.70	4.15	<sup>(2)</sup>
<b>Galveston, Tex.:</b>						
Austin, Tex. ....	<sup>(1)</sup>	<sup>(1)</sup>	2.34	<sup>(1)</sup>	<sup>(1)</sup>	0.37
Beaumont, Tex. ....	<sup>(1)</sup>	<sup>11.66</sup>	5.82	<sup>(1)</sup>	<sup>(1)</sup>	<sup>(1)</sup>
Belton, Tex. ....	0.42	<sup>(1)</sup>	3.77	<sup>(1)</sup>	2.97	0.06
Columbia, Tex. ....	0.30	0.65	4.71	<sup>(1)</sup>	5.20	0.57
Corpuscular, Tex. ....	0.00	<sup>(1)</sup>	0.04	<sup>(1)</sup>	<sup>(1)</sup>	3.36
Cuero, Tex. ....	0.00	0.32	2.29	<sup>(1)</sup>	<sup>74.03</sup>	0.30
Dallas, Tex. ....	0.00	2.22	0.00	1.43	<sup>76.99</sup>	9.69
Galveston, Tex. ....	1.95	1.77	7.04	7.87	6.41	3.28
Hearne, Tex. ....	0.00	0.94	2.40	<sup>(1)</sup>	9.54	0.00
Hempstead, Tex. ....	0.01	0.03	4.05	<sup>(1)</sup>	<sup>(2)</sup>	<sup>(2)</sup>
Houston, Tex. ....	1.61	1.88	10.03	5.28	4.55	2.43
Huntville, Tex. ....	<sup>(1)</sup>	0.33	2.81	<sup>(1)</sup>	6.38	0.71
Longview, Tex. ....	0.03	1.01	8.16	<sup>(1)</sup>	4.92	5.86
Luling, Tex. ....	<sup>(1)</sup>	0.70	2.53	1.76	<sup>(1)</sup>	0.00
Orange, Tex. ....	<sup>20.20</sup>	0.18	1.20	0.26	<sup>(1)</sup>	0.10
Palestine, Tex. ....	0.06	0.66	3.99	1.45	6.08	2.07
San Antonio, Tex. ....	0.00	0.22	2.83	1.53	<sup>76.79</sup>	0.86
Sour Lake, Tex. ....	0.94	3.22	3.28	4.45	<sup>73.10</sup>	5.06
Tyler, Tex. ....	0.00	2.01	8.25	<sup>(1)</sup>	2.08	1.24
Waco, Tex. ....	0.06	<sup>(1)</sup>	1.10	<sup>(1)</sup>	12.44	2.22
Weatherford, Tex. ....	<sup>(1)</sup>	<sup>(1)</sup>	0.29	<sup>(1)</sup>	7.50	4.22
Weimar, Tex. ....	0.00	0.70	3.66	0.88	10.43	0.18
<b>Vicksburg, Miss.:</b>						
Edwards, Miss. ....	4.38	1.84	1.87	1.33	2.59	0.81
Jackson, Miss. ....	0.20	1.63	2.45	1.14	2.89	1.71
Lake, Miss. ....	5.88	6.80	1.90	1.29	3.86	2.45
Monroe, La. ....	3.83	3.48	1.46	1.55	3.43	4.10

<sup>1</sup> No record.<sup>2</sup> 24 days only.<sup>3</sup> 25 days only.<sup>4</sup> Record incomplete.<sup>5</sup> Observations discontinued.<sup>6</sup> 20 days only.<sup>7</sup> 27 days only.<sup>8</sup> 18 days only.<sup>9</sup> 23 days only.

*Precipitation at the cotton-region stations of the Signal Service, &c.—Continued.*

Stations.	1894.				1895.	
	July.	August.	September.	October.	May.	June.
Vicksburg, Miss.—Continued:	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>
Vicksburg, Miss.....	4.99	2.88	5.12	1.08	4.75	2.90
Little Rock, Ark.:						
Arkansas City, Ark.....	2.97	1.02	2.70	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>2</sup> )
Brinkley, Ark.....	3.56	1.48	5.51	0.00	0.90	1.62
Devall's Bluff, Ark.....	3.60	1.20	3.50	1.19	4.23	2.71
Fort Smith, Ark.....	5.98	3.73	5.03	1.81	2.59	4.88
Helena, Ark.....	4.43	1.04	1.94	1.10	0.48	2.43
Kensett, Ark.....	3.40	2.20	3.00	1.45	1.24	3.96
Little Rock, Ark.....	4.23	3.26	5.00	1.80	3.26	3.39
Madison, Ark.....	4.40	0.50	4.30	0.00	1.60	1.30
Magnolia, Ark.....	3.00	3.73	2.53	0.65	1.85	5.74
Malvern, Ark.....	4.96	2.56	1.38	0.05	6.11	3.67
Monticello, Ark.....	2.61	2.37	3.30	1.10	5.05	3.55
Newport, Ark.....	1.20	0.91	7.91	1.14	1.09	2.08
Paris, Tex.....	0.48	1.28	1.95	( <sup>3</sup> )	2.52	2.24
Pine Bluff, Ark.....	2.04	0.78	2.87	1.14	3.15	2.45
Prescott, Ark.....	0.72	0.99	4.20	0.77	2.16	1.17
Russellville, Ark.....	( <sup>4</sup> ) 4.12	0.32	7.38	( <sup>1</sup> )	1.58	2.95
Toxarkana, Ark.....	0.98	1.21	3.00	0.40	( <sup>1</sup> )	4.03
Memphis, Tenn.:						
Batesville, Ark.....	7.23	2.43	1.91	1.85	1.45	3.06
Bolivar, Tenn.....	3.75	0.70	2.12	( <sup>1</sup> )	2.40	5.95
Brownsville, Tenn.....	5.99	2.53	2.14	1.42	1.07	9.75
Corinth, Miss.....	3.06	2.40	0.83	2.90	0.33	0.38
Covington, Tenn.....	1.90	2.65	2.56	3.13	1.87	4.75
Decatur, Ala.....	6.47	1.58	0.29	1.81	5.92	4.76
Dyersburg, Tenn.....	4.63	2.61	3.75	3.04	3.25	7.12
Grand Junction, Tenn.....	5.11	1.21	1.24	2.43	2.26	6.56
Grenada, Miss.....	2.83	1.08	0.58	1.33	2.57	1.95
Hernando, Miss.....	5.88	2.73	2.41	1.69	0.60	4.03
Holly Springs, Miss.....	4.93	2.18	0.83	2.21	2.22	4.63
Memphis, Tenn.....	2.33	1.27	4.29	2.53	3.05	1.52
Milan, Tenn.....	6.28	1.11	4.88	1.61	3.17	5.19
Nashville, Tenn.....	3.16	2.73	2.31	2.38	4.32	3.70
Oxford, Miss.....	4.70	1.75	2.90	1.20	1.52	6.68
Paris, Tenn.....	2.53	1.81	5.26	4.59	2.99	5.25
Scottsborough, Ala.....	7.64	0.25	0.67	2.57	( <sup>4</sup> ) 7.45	5.93
Tusculum, Ala.....	5.16	1.95	1.05	0.70	8.54	0.63
Withee, Tenn.....	( <sup>2</sup> )	0.27	0.79	6.50	0.15	0.30

<sup>1</sup> No record.<sup>2</sup> Record incomplete.<sup>3</sup> 19 days only.<sup>4</sup> 26 days only.

## APPENDIX 35.

*Mean relative humidity at stations of the Signal Service, United States Army, for each month and the year. (Computed from the commencement of observations at each, to and including July, 1872.)*

[The daily means are obtained by dividing the sum of the 7.35 a. m., 4.35 and 11.35 p. m. (Washington time) observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month.]

Stations.	JANUARY.	FEBRUARY.	MARCH.	APRIL.	MAY.	JUNE.	JULY.	AUGUST.	SEPTEMBER.	OCTOBER.	NOVEMBER.	DECEMBER.	ANNUAL.
New England:	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.
Mount Washington, N. H.	73.6	67.7	67.0	78.9	81.9	83.2	85.7	82.5	76.7	75.7	70.3	73.5	73.5
Boston, Mass.	65.4	63.6	66.8	61.9	60.6	69.2	68.4	71.2	67.2	69.6	65.5	68.6	68.2
New London, Conn.	74.9	73.2	73.8	69.8	68.5	72.3	74.6	80.1	72.5	76.7	71.4	74.0	74.0
Middle Atlantic States:													
New York City	69.4	63.8	67.6	62.0	61.3	67.4	72.1	75.3	69.5	72.8	70.8	71.6	69.6
Philadelphia, Pa.	71.9	68.2	67.2	59.8	58.9	67.2	67.9	72.0	66.5	71.5	68.7	72.1	69.6
Cape May, N. J.	73.7	78.1	77.7	69.4	76.4	83.4	82.6	85.5	74.4	80.1	72.2	74.2	74.2
Baltimore, Md.	65.3	63.2	70.4	58.3	58.3	64.0	62.8	70.5	65.8	67.1	67.1	64.0	68.2
Washington City	65.8	64.6	64.8	55.2	61.0	64.8	65.0	72.6	68.6	74.0	68.5	67.9	68.2
Lynchburg, Va.	65.8	69.5	59.0	62.6	64.1	72.9	77.0	77.1	75.1	76.8	73.1	71.0	69.6
South Atlantic States:													
Wilmington, N. C.	71.7	75.2	74.0	70.4	69.5	74.1	73.3	82.5	77.1	80.4	76.0	73.9	73.9
Charleston, S. C.	74.6	74.0	74.6	69.8	71.2	74.8	75.2	83.5	78.3	81.5	77.0	75.8	77.1
Augusta, Ga.	72.4	74.6	73.4	67.8	69.0	69.9	72.8	76.3	74.2	76.8	77.1	74.8	74.8
Savannah, Ga.	71.1	74.9	76.2	68.6	70.4	75.0	73.0	81.8	83.3	84.5	78.2	75.8	77.1
Florida Peninsula:													
Key West, Fla.	80.3	77.8	75.1	70.6	60.1	69.4	70.2	71.6	77.6	79.8	78.0	80.3	75.9
Eastern Gulf States:													
Mobile, Ala.	74.6	79.7	78.5	73.5	71.9	76.0	78.6	74.9	73.6	79.9	78.2	79.6	77.0
New Orleans, La.	73.0	74.0	75.0	73.0	73.0	75.0	74.0	79.0	77.0	78.0	75.0	76.5	76.1
Western Gulf States:													
Galveston, Tex.	76.6	80.0	81.3	79.0	69.6	73.1	71.9	71.8	75.2	81.0	77.9	81.9	73.9
Ohio Valley and Tennessee:													
Knoxville, Tenn.	71.9	69.6	62.3	59.8	70.0	76.6	74.6	68.1	73.7	74.2	75.0	70.1	71.1
Memphis, Tenn.	64.8	69.7	62.6	61.7	64.6	68.8	72.8	74.3	68.9	71.0	74.1	65.5	69.6
Nashville, Tenn.	63.4	68.8	58.6	60.1	59.7	65.5	68.8	66.7	67.9	64.9	73.8	65.7	69.6
Indianapolis, Ind.	79.9	74.9	68.4	60.1	64.6	68.4	69.2	72.4	70.9	67.6	74.9	74.3	74.3
Cincinnati, Ohio	76.9	74.3	70.0	60.6	59.0	59.2	64.5	70.5	73.8	71.7	73.6	71.8	71.8
Pittsburg, Pa.	61.5	57.3	58.3	57.6	63.2	64.2	67.2	69.1	66.6	58.8	65.2	68.2	68.2
Lower Lakes:													
Oswego, N. Y.	71.0	68.3	71.8	65.5	64.6	69.0	68.9	66.5	66.5	62.7	70.3	75.1	67.8
Rochester, N. Y.	76.4	70.4	71.3	63.0	61.0	64.5	65.8	66.8	68.1	61.6	72.4	73.6	67.9
Cleveland, Ohio	74.3	67.3	65.4	59.9	66.7	69.0	69.7	75.0	69.4	65.1	72.6	71.0	69.5
Toledo, Ohio	76.4	78.2	69.0	62.2	61.2	66.8	68.1	77.4	70.9	64.2	72.6	65.7	70.5
Detroit, Mich.	82.0	73.8	72.4	64.0	63.8	71.2	71.9	75.8	72.9	64.2	81.7	86.6	73.9
Upper Lakes:													
Escanaba, Mich.	77.0	77.1	74.0	73.4	78.7	77.0	77.2	78.4	80.2	81.0	67.8	65.9	73.9
Grand Haven, Mich.	78.8	75.2	75.7	63.4	67.3	71.8	71.8	74.4	74.3	67.4	79.1	81.6	73.9
Marquette, Mich.	84.0	81.7	81.8	63.6	60.8	64.0	66.7	61.3	55.0	65.0	74.3	76.5	73.9
Duluth, Minn.	73.2	61.4	59.6	63.8	69.4	67.8	69.8	66.2	60.4	66.2	75.2	71.4	71.4
Upper Mississippi Valley:													
Saint Paul, Minn.	66.3	68.6	67.8	68.8	64.9	71.0	72.4	72.8	69.5	68.5	72.7	71.0	69.6
Keokuk, Iowa.	70.6	67.6	67.1	60.8	62.2	64.0	63.1	67.4	64.6	64.0	75.0	67.2	69.6
Calro, Ill.	70.0	69.7	56.8	56.2	65.2	69.3	74.0	75.4	75.0	70.0	69.7	66.5	69.6
Saint Louis, Mo.	69.4	66.8	61.4	56.4	64.4	66.6	74.0	68.3	63.9	59.2	71.5	65.3	67.5
Missouri Valley:													
Leavenworth, Kans.	73.5	72.3	67.1	61.9	66.4	56.4	63.4	52.1	43.1	35.4	42.2	64.5	69.6
Omaha, Nebr.	71.5	74.0	68.6	58.4	68.6	67.8	72.6	72.1	67.9	60.1	71.8	72.8	68.9
Northern Slope:													
Cheyenne, Wyo.	41.6	48.3	53.0	56.8	59.6	55.2	59.4	49.4	54.9	48.9	62.8	61.4	59.6
Middle Pacific Coast:													
San Francisco, Cal.	75.2	82.7	84.4	70.4	71.7	71.6	80.8	81.1	77.4	64.4	68.1	81.1	73.9

## APPENDIX 36.

*Mean relative humidity at stations of the Signal Service, United States Army, for each month and the year. (Computed from September, 1872, to and including October, 1879, except at stations opened subsequent to the former date.)*

[The daily means are obtained by dividing the sum of the 7.35 a. m., 4.35 and 11 p. m. (Washington time) observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
<b>New England:</b>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>
Eastport, Me.....	79.4	77.7	77.6	73.4	73.0	73.3	79.5	79.7	80.1	77.2	77.1	78.1	77.7
Portland, Me.....	75.0	71.5	71.1	65.9	63.7	63.5	70.3	71.9	74.0	71.3	72.3	74.5	70.6
Mount Washington, N. H.....	87.1	85.2	86.5	87.9	84.0	84.2	87.0	85.3	85.6	89.0	88.1	84.3	86.5
Burlington, Vt.....	72.3	70.5	71.0	66.9	62.2	64.6	66.4	63.1	69.6	63.7	69.3	71.9	68.5
Boston, Mass.....	73.3	71.4	70.3	67.1	62.3	67.0	69.4	71.8	73.2	69.2	72.3	73.9	70.2
New Haven, Conn.....	75.2	73.4	71.6	65.2	63.8	70.2	70.7	74.0	74.8	71.7	72.5	74.0	71.2
New London, Conn.....	74.8	70.6	71.8	67.8	67.6	75.1	75.7	76.4	75.3	72.8	71.5	70.9	72.5
<b>Middle Atlantic States:</b>													
Albany, N. Y.....	80.4	78.6	76.3	69.2	65.4	70.4	71.2	71.5	75.0	77.1	82.1	80.3	75.5
New York City.....	70.2	70.6	65.5	64.7	62.2	63.1	69.6	69.3	72.1	67.9	68.3	69.9	68.0
Philadelphia, Pa.....	73.5	67.5	64.9	62.6	60.6	66.8	66.1	70.9	70.3	67.2	67.5	71.4	67.3
Atlantic City, N. J.....	82.3	77.6	78.6	76.5	77.5	82.2	83.1	83.0	81.1	78.4	77.7	80.6	78.9
Barnegat City, N. J.....	81.3	78.3	78.4	75.6	74.6	79.3	80.9	79.3	73.5	77.1	78.6	80.0	78.4
Cape May, N. J.....	78.4	77.1	76.3	75.5	75.3	79.3	80.6	80.3	76.3	74.4	74.1	75.2	77.3
Sandy Hook, N. J.....	76.2	73.8	74.2	72.3	70.0	73.9	74.5	73.8	75.2	71.9	73.2	74.1	73.9
Baltimore, Md.....	71.5	67.9	65.1	61.5	60.7	64.5	64.5	70.5	71.6	68.0	67.1	68.7	67.3
Washington City.....	72.6	67.9	63.3	62.6	62.3	66.3	66.2	73.5	73.4	70.4	71.1	71.4	69.0
Cape Henry, Va.....	75.0	72.3	73.3	71.3	72.0	73.3	74.3	77.6	75.6	72.1	72.6	73.1	74.1
Lynchburg, Va.....	66.7	60.0	64.7	56.6	60.4	65.3	65.3	72.6	70.4	67.1	65.2	65.1	64.3
Norfolk, Va.....	73.4	70.5	65.4	66.7	69.3	70.2	69.3	76.2	77.1	73.9	74.1	71.2	71.7
<b>South Atlantic States:</b>													
Cape Hatteras, N. C.....	79.3	77.5	78.1	73.7	73.1	79.4	80.4	81.0	73.9	76.3	74.9	76.2	73.2
Charlotte, N. C.....	69.5	61.4	58.6	53.0	63.3	62.2	66.1	77.9	63.4	67.2	71.1	70.1	.....
Kitty Hawk, N. C.....	73.5	75.3	77.6	76.6	73.9	73.9	80.7	81.5	79.6	73.2	73.0	77.9	73.9
Smithville, N. C.....	73.6	74.3	75.3	74.9	73.7	76.3	77.4	78.4	77.5	73.7	76.3	77.7	75.9
Wilmington, N. C.....	71.0	67.0	67.2	66.3	70.6	73.3	75.2	73.5	77.2	74.0	72.0	72.1	72.3
Charleston, S. C.....	73.3	70.4	63.3	69.5	72.1	73.2	73.6	75.1	75.4	74.4	73.6	72.4	73.1
Augusta, Ga.....	74.0	67.9	63.2	62.9	64.3	63.3	69.1	73.9	72.5	71.0	72.7	74.3	70.4
Savannah, Ga.....	71.4	63.3	65.3	64.7	69.2	71.6	73.1	75.7	73.6	74.4	71.3	70.5	71.4
Jacksonville, Fla.....	73.7	70.3	65.3	65.0	67.5	71.3	71.2	73.3	77.9	73.4	73.5	72.7	71.2
<b>Florida Peninsula:</b>													
Key West, Fla.....	79.4	77.3	69.6	63.3	70.0	71.1	71.0	71.6	74.4	75.5	77.4	73.2	73.5
Punta Rasa, Fla.....	77.1	73.5	72.1	70.3	72.0	74.4	73.1	77.0	77.7	73.9	74.9	74.4	74.3
<b>Eastern Gulf States:</b>													
Atlanta, Ga.....	67.3	57.6	53.0	54.3	57.3	56.4	64.2	73.9	65.4	71.9	65.3	70.3	.....
Mobile, Ala.....	77.9	72.6	72.9	71.6	70.6	73.0	74.0	77.9	74.9	73.6	74.6	77.6	73.9
Montgomery, Ala.....	72.4	66.2	64.1	63.3	62.9	63.2	69.3	70.1	63.0	63.1	70.2	72.6	68.0
Vicksburg, Miss.....	70.9	64.3	64.4	66.4	63.6	70.1	72.4	72.9	71.4	69.6	63.5	69.6	68.0
New Orleans, La.....	71.0	66.9	69.7	63.0	63.6	71.4	72.3	72.7	71.2	63.2	71.1	72.0	70.3
<b>Western Gulf States:</b>													
Shreveport, La.....	74.7	63.0	66.3	66.4	63.2	69.6	70.6	70.3	70.3	71.2	70.7	74.1	70.2
Fort Gibson, Ind. T.....	69.5	63.5	53.3	60.5	67.7	71.1	68.0	67.1	63.5	64.1	63.6	67.9	67.2
Corpusaca, Tex.....	72.2	62.9	60.9	64.3	71.4	70.5	67.3	63.1	64.4	63.2	67.0	66.9	67.0
Denison, Tex.....	71.2	63.4	60.6	63.4	72.2	72.6	69.5	63.1	63.3	59.3	65.1	66.5	63.7
Galveston, Tex.....	76.3	76.0	73.9	73.3	74.1	72.2	71.3	73.2	72.5	72.2	76.9	80.4	74.3
Indianola, Tex.....	81.3	74.9	79.0	73.9	76.9	75.5	73.7	75.1	75.9	74.3	76.9	81.4	77.8
San Antonio, Tex.....	69.9	62.3	62.0	60.5	67.9	69.4	60.1	65.2	64.3	65.1	63.0	69.2	69.2
<b>Rio Grande Valley:</b>													
Brownsville, Tex.....	73.6	74.6	75.1	70.9	71.9	63.9	63.3	70.4	75.4	72.4	74.0	76.1	72.0
Rio Grande City, Tex.....	69.3	64.9	65.7	61.6	62.1	68.0	53.0	67.2	63.8	70.4	63.2	63.5	.....
<b>Ohio Valley and Tennessee:</b>													
Knoxville, Tenn.....	74.1	63.1	62.3	59.7	62.5	71.4	71.9	74.9	72.1	63.1	71.3	74.7	69.3
Memphis, Tenn.....	71.3	65.7	60.4	59.7	63.4	63.1	70.3	70.3	69.6	67.0	64.9	69.3	67.0
Nashville, Tenn.....	72.1	67.5	61.3	59.4	59.6	65.6	66.7	63.6	63.7	66.2	63.7	71.3	63.6
Louisville, Ky.....	72.3	66.0	61.1	57.6	57.9	62.9	65.3	66.7	66.0	64.2	63.0	70.2	65.4
Indianapolis, Ind.....	70.2	63.3	67.1	57.6	58.2	66.7	63.3	69.7	63.8	64.9	70.0	73.7	67.3
Cincinnati, Ohio.....	70.3	63.4	63.9	57.4	56.3	63.4	65.1	67.3	65.6	62.5	67.0	70.7	65.4
Columbus, Ohio.....	65.0	60.7	64.5	54.0	54.3	60.1	64.5	60.4	70.4	66.0	69.4	73.0	.....

*Mean relative humidity at stations of the Signal Service, United States Army, for each month and the year, &c.—Continued.*

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
<b>Ohio Valley and Tennessee—</b>													
Continued:	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>
Morgantown, W. Va. ....	72.6	68.2	64.2	62.1	61.4	67.6	71.8	73.2	74.3	71.9	72.9	73.0	69.4
Pittsburg, Pa. ....	73.4	73.5	70.6	64.8	60.2	63.8	69.6	70.4	72.5	71.7	72.8	78.4	70.4
<b>Lower Lakes:</b>													
Buffalo, N. Y. ....	79.0	78.0	75.7	71.7	65.4	69.5	71.5	69.5	70.6	71.0	75.9	80.4	78.3
Oswego, N. Y. ....	77.8	75.6	72.9	68.8	63.8	69.1	70.4	70.1	70.7	70.6	72.0	77.2	71.0
Rochester, N. Y. ....	81.4	78.2	76.3	67.5	59.7	65.1	66.6	66.8	69.6	70.9	76.8	81.0	71.9
Erie, Pa. ....	80.6	78.3	77.7	69.7	64.0	69.0	69.9	69.5	72.0	71.5	75.3	80.9	72.0
Cleveland, Ohio ....	77.7	74.8	77.0	68.1	62.7	67.8	71.0	60.7	70.1	69.3	74.3	78.5	71.8
Sandusky, Ohio ....	76.0	75.8	76.0	68.0	68.0	68.2	71.6	60.8	72.4	70.6	74.0	77.1	72.8
Toledo, Ohio ....	74.8	72.8	71.7	63.7	61.8	67.2	69.6	70.4	71.5	69.0	70.8	75.6	70.0
Detroit, Mich. ....	77.6	74.2	73.5	63.6	60.8	67.7	70.2	69.9	72.9	70.5	74.7	77.8	71.2
<b>Upper Lakes:</b>													
Alpena, Mich. ....	76.5	72.1	75.2	69.1	67.4	72.2	71.8	75.7	77.2	77.4	81.5	79.5	74.9
Escanaba, Mich. ....	75.3	71.5	70.8	68.9	68.4	72.2	71.4	74.2	76.8	75.6	79.0	78.6	73.9
Grand Haven, Mich. ....	77.1	74.7	74.9	66.8	65.1	71.1	71.7	73.6	74.6	72.5	74.4	76.8	73.2
Marquette, Mich. ....	75.2	73.0	72.1	67.5	64.6	67.8	66.8	68.4	70.4	70.2	74.3	76.3	70.7
Port Huron, Mich. ....	79.0	77.0	77.5	69.1	65.9	71.1	73.0	71.0	72.6	72.2	77.7	80.9	74.6
Chicago, Ill. ....	76.2	73.3	72.0	68.7	67.0	69.4	70.2	70.3	68.5	68.0	71.0	73.9	71.0
Milwaukee, Wis. ....	79.1	77.0	77.0	71.6	68.6	73.2	74.3	73.6	72.9	71.9	75.3	78.8	75.0
Duluth, Minn. ....	78.4	73.0	69.8	65.6	65.7	71.7	67.7	71.1	73.2	68.3	73.6	74.1	70.2
<b>Upper Mississippi Valley:</b>													
Saint Paul, Minn. ....	71.8	70.6	68.9	57.8	57.6	66.3	67.9	69.9	70.0	69.0	72.6	70.2	68.5
La Crosse, Wis. ....	72.7	71.5	68.5	59.4	60.3	68.8	70.1	68.9	71.9	67.6	73.4	74.4	68.8
Davenport, Iowa ....	77.9	74.7	71.8	62.1	62.9	69.0	67.7	67.2	69.0	65.5	71.6	77.1	70.3
Des Moines, Iowa ....	76.3	70.1	67.2	57.8	63.6	69.8	66.1	69.0	65.6	65.6	67.6	74.4	...
Unquique, Iowa ....	70.4	69.6	68.7	60.8	60.4	67.7	65.1	69.0	69.9	67.1	73.0	72.1	68.0
Keokuk, Iowa ....	75.6	72.1	69.0	63.6	64.6	70.2	68.8	67.8	68.6	66.0	70.0	75.4	69.9
Calro, Ill. ....	71.9	67.2	62.9	61.0	65.6	71.8	70.5	71.6	72.2	67.6	66.5	70.6	68.3
Saint Louis, Mo. ....	67.9	66.8	63.8	56.2	58.4	65.0	65.4	64.7	63.5	59.6	63.9	69.2	64.2
<b>Missouri Valley:</b>													
Leavenworth, Kans. ....	73.6	69.9	64.5	60.7	64.6	67.7	68.2	64.0	64.1	62.6	64.9	71.1	66.8
Omaha, Nebr. ....	74.6	72.9	67.6	60.7	63.7	68.8	71.2	64.2	69.5	63.6	70.1	72.7	69.4
Yankton, Dak. ....	67.6	69.0	69.4	66.0	67.2	71.1	71.4	70.6	66.7	61.4	66.6	68.9	67.8
<b>Extreme Northwest:</b>													
Breckenridge, Minn. ....	77.0	77.7	76.9	72.1	66.3	72.7	72.4	75.8	73.5	68.5	78.8	79.3	74.5
Bismarck, Dak. ....	69.8	72.1	70.0	63.2	62.9	68.8	69.0	59.2	59.2	61.2	69.2	70.1	64.0
Pembina, Dak. ....	83.5	84.9	82.1	72.7	67.3	72.1	71.3	74.8	73.9	74.7	82.8	85.1	76.2
<b>Northern Slope:</b>													
Cheyenne, Wyo. ....	58.8	54.5	55.4	54.0	53.5	44.3	46.8	46.8	44.9	44.9	53.2	57.4	52.2
North Platte, Nebr. ....	69.7	68.1	63.5	58.8	63.8	58.9	63.8	61.8	58.9	58.4	64.2	67.8	63.5
<b>Middle Slope:</b>													
Denver, Colo. ....	52.0	51.5	46.4	48.7	45.2	40.2	44.5	45.2	43.9	40.9	47.1	58.4	46.5
Pike's Peak, Colo. ....	64.0	65.2	71.6	73.6	67.6	61.8	61.7	62.0	63.2	62.1	64.3	64.2	68.6
Dodge City, Kans. ....	71.7	69.8	63.3	58.0	63.2	60.9	62.1	63.2	57.8	57.8	62.4	67.8	63.6
<b>Southern Slope:</b>													
Sill, Fort, Ind. T. ....	65.4	63.4	52.0	55.5	62.4	65.3	63.2	62.1	60.9	58.8	65.2	71.4	62.8
Concho, Fort, Tex. ....	59.4	52.1	51.8	54.0	53.2	55.0	51.2	58.8	58.5	56.6	53.2	49.8	54.8
Davis, Fort, Tex. ....	47.1	45.1	42.7	28.5	26.5	51.4	50.6	54.5	47.3	47.8	42.2	51.9	...
Stockton, Fort, Tex. ....	50.3	45.7	40.5	38.6	43.7	46.0	34.8	33.1	43.0	43.3	58.6	61.9	41.3
<b>Southern Plateau:</b>													
La Mesilla, N. Mex. ....	56.0	47.0	38.2	36.7	27.0	30.5	49.0	49.0	41.2	45.5	43.6	56.6	45.4
Santa Fe, N. Mex. ....	52.2	51.1	38.6	35.0	29.0	30.7	46.3	49.1	42.0	39.4	45.5	50.3	43.4
El Paso, Tex. ....	52.7	56.9	47.6	44.0	40.9	43.8	46.4	51.5	57.4	58.7	58.6	61.3	...
Apache, Fort, Ariz. ....	62.3	51.3	35.8	30.1	23.2	25.8	52.2	57.4	39.8	40.6	56.2	50.3	...
Florence, Ariz. ....	50.5	48.0	41.7	40.1	29.0	24.2	35.5	35.2	35.5	39.5	38.4	48.4	41.9
Grant, Fort, Ariz. ....	51.7	44.2	27.7	30.0	23.6	25.4	44.0	49.6	33.9	29.2	40.3	40.6	...
Prescott, Ariz. ....	51.1	48.6	40.8	41.2	24.2	24.0	34.5	41.8	35.6	35.8	43.0	47.5	42.8
Tucson, Ariz. ....	36.8	45.2	41.2	36.0	30.4	26.8	38.6	43.0	41.7	43.7	34.2	39.0	41.5
Yuma, Ariz. ....	40.4	40.3	37.9	37.1	23.6	28.4	34.0	34.7	35.7	34.7	35.6	42.6	35.3
<b>Middle Plateau:</b>													
Pioche, Nev. ....	64.4	58.6	41.0	43.2	26.6	27.0	16.6	24.7	20.2	30.9	41.0	52.6	41.9
Winnemucca, Nev. ....	62.9	61.0	50.0	48.4	38.6	35.8	21.2	20.8	25.6	40.4	58.5	57.4	44.6
Salt Lake City, Utah ....	66.7	60.4	49.8	42.5	40.0	52.2	29.8	29.0	30.2	39.5	55.7	67.9	46.7
<b>Northern Plateau:</b>													
Boise City, Idaho ....	69.8	67.0	61.2	53.0	52.6	47.6	37.2	37.3	45.8	58.3	64.6	68.4	55.9
Umatilla, Oreg. ....	80.0	75.8	64.4	58.8	53.4	45.1	44.2	38.6	45.8	62.1	76.6	82.4	58.6
<b>North Pacific Coast:</b>													
Olympia, Wash. ....	85.4	85.6	84.8	75.5	71.3	69.2	69.1	73.1	80.4	85.1	85.5	86.7	78.3
Portland, Oreg. ....	75.8	76.7	76.6	68.0	65.9	63.3	63.9	66.6	67.5	75.2	76.6	76.9	70.8
Roseburg, Oreg. ....	82.8	78.6	79.8	73.5	73.3	63.4	66.2	63.2	67.0	78.7	87.3	90.5	74.8

*Mean relative humidity at stations of the Signal Service, United States Army, for each month and the year, &c.—Continued.*

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
<b>Middle Pacific Coast:</b>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>
Red Bluff, Cal. ....	72.6	73.0	71.8	59.8	50.8	33.2	33.0	33.0	34.7	43.3	66.8	62.0	53.2
Sacramento, Cal. ....	74.8	76.8	75.0	66.9	61.3	52.9	51.7	50.7	50.5	53.5	67.2	66.5	62.2
San Francisco, Cal. ....	71.8	72.3	70.5	69.4	71.3	71.9	77.7	79.0	77.2	71.9	72.2	71.5	72.9
<b>South Pacific Coast:</b>													
Campo, Cal. ....	63.8	67.0	68.8	67.7	65.3	58.9	55.8	52.1	48.2	54.0	50.6	56.1	61.9
Los Angeles, Cal. ....	62.8	71.9	72.4	68.2	67.0	69.0	68.1	67.4	69.0	60.2	51.9	52.8	66.0
San Diego, Cal. ....	73.2	76.2	75.4	71.6	73.6	75.3	76.8	77.3	76.9	72.5	69.3	66.3	73.6
Visalia, Cal. ....	73.0	72.5	67.1	62.2	49.6	42.6	41.0	41.9	47.0	59.3	70.2	66.4	61.2
<b>Alaska Stations:</b>													
Saint Michael's, Fort, Alaska. ....	95.8	97.4	97.8	93.8	91.4	82.7	80.4	83.4	85.7	88.4	86.7	94.3	90.8



## APPENDIX 37.

*Mean relative humidity at stations of the Signal Service, United States Army, for each month and the year. (Computed from November, 1879, to December, 1884, both inclusive, except at stations opened subsequent to the former date.)*

[The daily means are obtained by dividing the sum of the 7 a. m., 8 and 11 p. m. (Washington time) observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
<b>New England:</b>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>
Eastport, Me. ....	73.8	74.8	72.5	70.3	74.5	74.0	78.5	78.5	78.2	75.0	73.4	78.3	74.9
Portland, Me. ....	71.1	69.2	65.4	60.0	64.5	66.5	69.6	70.9	72.9	69.6	69.2	72.4	68.4
Mount Washington, N. H. ....	82.1	85.2	88.4	86.5	86.6	81.6	88.1	86.6	85.6	86.6	87.7	84.8	85.7
Boston, Mass. ....	71.9	72.7	71.0	66.4	70.6	69.7	71.9	72.8	74.1	71.1	70.2	72.3	71.3
Block Island, R. I. ....	75.1	77.1	74.4	75.2	82.2	82.8	82.2	82.6	82.6	77.8	76.1	78.7	78.9
New Haven, Conn. ....	73.3	73.1	68.1	64.7	70.1	71.2	73.4	75.1	76.0	73.7	71.0	75.6	72.1
New London, Conn. ....	72.7	74.9	71.3	68.6	72.7	75.1	77.0	78.1	78.9	76.8	72.0	75.1	74.5
<b>Middle Atlantic States:</b>													
Albany, N. Y. ....	69.2	68.3	65.6	56.1	58.8	60.8	63.0	63.9	67.9	65.5	67.1	71.8	64.6
New York City ....	77.4	77.3	71.8	65.4	70.3	70.6	71.9	72.3	74.1	72.0	71.0	76.8	72.8
Philadelphia, Pa. ....	76.4	72.7	69.5	68.2	74.0	72.8	70.8	73.6	72.7	72.3	69.7	74.9	72.3
Atlantic City, N. J. ....	77.8	78.8	76.0	76.1	80.3	81.0	80.3	81.7	81.3	77.7	76.7	79.0	78.8
Barnegat City, N. J. ....	80.9	80.2	74.1	74.1	79.3	79.4	79.4	81.4	81.7	79.7	76.4	80.4	78.8
Cape May, N. J. ....	79.1	77.2	73.9	74.4	77.9	78.2	77.5	79.5	77.9	75.5	71.6	77.2	76.8
Sandy Hook, N. J. ....	77.4	78.0	74.8	72.2	73.8	73.4	72.6	74.7	75.1	71.9	71.3	75.8	74.6
Delaware Breakwater, Del. ....	83.7	79.9	78.7	76.5	78.6	80.3	79.5	79.8	80.8	78.0	76.6	79.1	80.0
Baltimore, Md. ....	71.0	67.0	63.8	59.7	61.9	65.0	64.6	68.1	69.3	69.1	65.0	68.4	66.1
Washington City ....	78.5	72.8	68.5	65.4	66.1	69.0	69.4	72.0	73.4	73.1	70.7	75.2	71.3
Cape Henry, Va. ....	79.5	75.1	71.7	70.8	71.6	74.1	75.3	77.7	76.6	74.2	69.5	73.2	74.3
Chincoteague, Va. ....	83.7	80.2	76.0	77.1	81.8	88.0	82.2	83.9	81.8	80.6	77.8	80.1	80.8
Lynchburg, Va. ....	68.6	63.8	58.3	58.8	60.5	66.0	62.8	65.6	67.8	67.8	64.2	67.6	64.2
Norfolk, Va. ....	77.6	71.2	67.8	66.8	67.1	69.3	71.5	75.5	75.7	75.6	70.6	73.2	71.8
<b>South Atlantic States:</b>													
Charlotte, N. C. ....	74.4	67.0	68.6	63.3	61.6	63.5	62.9	67.1	70.7	69.0	67.0	71.2	66.7
Hatteras, N. C. ....	85.8	81.8	77.0	70.9	80.4	82.9	80.8	81.7	81.4	82.2	79.6	81.1	81.4
Kitty Hawk, N. C. ....	82.4	77.7	73.4	75.6	77.4	77.9	77.5	80.8	79.6	78.1	74.8	78.1	77.8
Macon, Fort, N. C. ....	83.6	81.4	75.8	80.6	79.9	83.2	81.3	82.7	82.8	82.8	79.4	80.8	81.1
Smithville, N. C. ....	89.9	80.1	75.5	80.7	77.1	77.4	77.3	80.3	81.0	79.2	77.0	80.2	79.0
Wilmington, N. C. ....	74.9	71.0	67.1	65.7	71.4	73.7	75.9	78.4	75.6	75.3	71.4	73.6	73.1
Charleston, S. C. ....	79.2	74.0	71.0	73.8	73.4	73.8	75.4	77.9	78.5	79.1	75.1	77.7	75.9
Augusta, Ga. ....	73.9	67.5	64.4	65.8	62.9	63.5	67.3	71.4	71.5	71.2	69.6	71.4	68.9
Savannah, Ga. ....	73.0	67.8	62.0	65.5	63.4	70.0	69.8	71.8	76.7	76.2	74.0	71.0	70.6
Jacksonville, Fla. ....	76.6	71.8	65.5	68.5	70.5	71.7	73.2	75.7	77.4	77.1	76.5	76.0	73.4
<b>Florida Peninsula:</b>													
Cedar Keys, Fla. ....	81.4	76.2	73.1	73.6	70.7	74.2	73.6	75.3	75.1	75.9	77.9	81.2	75.7
Key West, Fla. ....	79.6	75.1	70.7	69.4	71.8	71.7	69.4	72.3	75.7	77.4	78.9	79.3	74.3
Sanford, Fla. ....	78.2	75.0	72.9	72.0	70.8	73.6	75.9	78.9	80.9	80.0	79.4	77.8	76.9
<b>Eastern Gulf States:</b>													
Atlanta, Ga. ....	73.7	65.1	62.3	68.0	63.4	68.0	66.4	73.0	70.5	70.1	65.2	69.9	67.4
Pensacola, Fla. ....	78.4	77.2	73.8	77.2	74.7	77.7	78.1	78.7	76.9	76.1	73.8	78.2	76.5
Mobile, Ala. ....	78.9	74.8	70.8	73.0	72.0	74.4	75.9	76.2	74.8	75.6	77.4	79.3	74.4
Montgomery, Ala. ....	74.7	68.6	65.8	67.7	65.8	70.1	68.9	72.5	69.4	68.7	70.8	74.4	69.7
Vicksburg, Miss. ....	72.8	68.5	63.5	65.6	69.7	72.1	73.8	70.8	72.9	75.1	71.6	72.4	70.7
New Orleans, La. ....	73.4	71.1	68.9	71.6	71.4	72.4	72.2	71.9	72.7	74.3	70.8	73.1	71.9
<b>Western Gulf States:</b>													
Shreveport, La. ....	74.6	73.7	66.6	67.6	72.8	70.5	69.9	69.4	70.9	75.0	74.0	72.1	71.5
Fort Smith, Ark. ....	71.8	72.6	61.6	64.4	63.1	73.8	73.3	72.9	71.5	76.8	69.6	72.2	70.8
Little Rock, Ark. ....	75.0	73.1	65.4	68.3	75.1	73.1	76.4	74.8	76.6	79.1	74.2	73.4	74.0
Galveston, Tex. ....	82.5	80.6	78.3	77.9	76.4	74.1	73.8	73.3	74.1	75.9	77.3	79.6	77.0
Indianola, Tex. ....	82.0	80.6	80.1	79.4	73.2	77.1	73.3	75.5	73.6	78.8	78.8	81.6	79.4
Falstein, Tex. ....	68.6	70.4	65.1	71.4	72.4	74.6	74.0	69.8	69.3	74.8	70.2	68.2	70.8
<b>Rio Grande Valley:</b>													
Brownsville, Tex. ....	82.0	81.1	80.6	77.8	73.3	77.1	77.1	76.8	79.0	81.2	80.4	82.9	79.8
Rio Grande City, Tex. ....	72.0	65.4	71.9	68.7	70.5	68.6	69.4	67.0	67.2	73.1	65.4	69.2	68.0
<b>Ohio Valley and Tennessee:</b>													
Chattanooga, Tenn. ....	74.7	67.7	63.7	64.5	68.3	72.9	71.3	75.9	78.6	75.9	74.0	72.2	71.1
Knoxville, Tenn. ....	79.4	70.2	66.4	63.5	66.1	72.6	73.7	74.6	72.0	75.5	71.1	74.2	71.0
Memphis, Tenn. ....	76.5	72.1	63.7	64.0	67.3	77.1	69.4	70.4	71.6	76.2	72.0	74.0	70.8

*Mean relative humidity at stations of the Signal Service, United States Army, for each month and the year, &c.—Continued.*

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
<b>Ohio Valley and Tennessee—</b>													
Continued:	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>
Nashville, Tenn.	77.6	71.5	68.1	67.0	65.8	70.0	70.1	69.7	71.7	73.6	71.5	75.7	71.1
Louisville, Ky.	74.1	68.2	63.6	60.6	66.7	71.4	67.3	67.5	70.4	74.0	67.1	71.4	69.0
Indianapolis, Ind.	73.0	71.3	65.6	61.5	61.7	67.8	65.3	64.4	68.5	71.9	70.2	74.4	68.0
Cincinnati, Ohio	74.6	70.7	64.7	62.5	62.9	67.6	62.8	63.2	65.8	70.8	70.4	74.2	67.7
Columbus, Ohio	74.4	71.1	65.7	62.7	63.1	66.4	62.4	64.2	67.5	71.3	69.6	74.6	67.7
Pittsburg, Pa.	78.2	73.4	68.5	62.5	63.6	68.3	68.1	68.8	68.6	71.6	70.7	77.9	70.0
<b>Lower Lakes:</b>													
Buffalo, N. Y.	80.6	78.6	75.9	71.7	71.2	73.0	72.6	70.2	73.5	74.1	75.2	78.2	74.7
Oswego, N. Y.	70.5	72.5	73.4	68.0	70.4	72.5	72.3	71.4	72.0	70.9	69.9	73.0	71.3
Rochester, N. Y.	79.6	78.8	76.7	67.6	67.6	67.9	68.5	68.4	69.8	73.3	75.5	80.6	72.6
Erie, Pa.	78.8	76.8	75.3	69.8	67.6	70.0	70.2	69.9	71.7	73.0	73.6	78.2	73.0
Cleveland, Ohio	80.0	77.0	75.0	67.1	66.0	69.0	68.4	69.4	69.2	69.5	72.8	80.0	71.9
Sandusky, Ohio	76.1	74.0	73.0	67.6	67.8	69.4	67.4	69.3	70.4	72.4	71.7	76.0	71.1
Toledo, Ohio	76.2	73.4	68.5	64.6	64.9	69.2	66.5	70.1	70.6	71.9	71.6	75.8	70.0
Detroit, Mich.	77.4	76.8	73.3	64.0	65.3	68.9	67.9	70.4	71.5	71.2	71.6	77.2	71.1
<b>Upper Lakes:</b>													
Alpena, Mich.	76.5	76.6	76.1	69.1	70.6	74.0	78.5	76.0	77.1	76.1	80.7	78.9	75.5
Escanaba, Mich.	75.4	73.3	72.0	67.8	67.6	72.4	72.5	77.2	77.5	76.0	76.8	78.3	74.1
Grand Haven, Mich.	80.4	80.5	77.1	68.0	68.5	73.5	75.1	77.2	75.9	78.4	77.1	80.9	75.8
Mackinaw City, Mich.	74.3	73.6	69.9	69.0	70.8	75.4	74.1	75.0	77.2	73.2	77.5	80.3	74.2
Marquette, Mich.	68.1	68.0	67.6	64.4	62.7	68.0	67.6	73.1	72.6	70.2	72.9	72.7	68.8
Port Huron, Mich.	81.9	80.8	80.8	78.2	70.2	74.3	74.9	74.9	75.5	77.5	81.3	83.4	77.3
Chicago, Ill.	71.3	70.0	68.9	66.7	67.7	73.4	70.3	69.9	69.2	72.2	71.4	74.8	70.0
Milwaukee, Wis.	79.3	78.1	75.6	60.2	68.6	74.6	73.5	78.1	75.6	74.1	75.1	70.6	75.8
Duluth, Minn.	77.2	73.8	71.6	69.9	71.2	74.7	69.1	76.8	74.9	73.7	77.9	78.0	74.2
<b>Upper Mississippi Valley:</b>													
Saint Paul, Minn.	77.1	71.5	68.9	62.2	64.3	71.2	72.7	74.5	73.1	70.7	71.0	72.7	70.9
La Crosse, Wis.	72.0	70.0	69.4	63.1	57.9	65.9	67.9	70.1	71.7	68.6	70.2	72.1	68.3
Davenport, Iowa	65.8	68.7	64.7	63.2	63.8	72.6	69.7	68.4	69.0	70.7	67.0	68.8	67.5
Des Moines, Iowa	68.5	68.3	67.3	63.3	66.6	73.4	72.6	70.8	70.5	71.6	69.1	71.4	69.5
Dubuque, Iowa	66.1	66.5	65.5	59.1	61.5	70.0	68.4	69.5	70.6	70.5	67.9	68.5	66.9
Keokuk, Iowa	74.9	71.5	69.1	64.5	65.2	72.5	68.6	66.9	67.5	72.6	70.7	75.4	70.2
Calro, Ill.	77.5	73.2	67.1	64.3	69.6	74.3	73.2	72.0	74.1	76.2	71.6	74.9	72.4
Springfield, Ill.	71.2	68.9	64.8	61.7	65.5	71.6	68.8	65.2	66.0	71.0	67.0	68.0	67.7
Saint Louis, Mo.	76.9	76.2	72.4	67.7	73.0	75.2	69.9	69.6	68.1	76.0	67.2	70.6	73.0
<b>Missouri Valley:</b>													
Leavenworth, Kans.	70.7	67.6	63.6	59.9	64.2	68.3	66.7	66.5	65.2	69.8	67.6	71.1	66.8
Omaha, Nebr.	71.1	69.7	67.1	62.2	65.9	69.7	68.8	70.1	69.3	69.9	67.7	72.0	68.7
Bennett, Fort, Dak.	71.5	72.4	72.6	68.0	67.8	70.0	68.5	63.4	62.2	65.3	67.9	74.1	69.2
Huron, Dak.	64.2	67.0	70.4	70.3	71.2	73.8	76.4	75.3	71.5	69.9	70.2	68.4	70.1
Yankton, Dak.	66.2	68.1	66.9	65.3	65.6	70.0	70.6	69.4	67.8	69.3	66.7	69.5	68.3
<b>Extreme Northwest:</b>													
Moorhead, Minn.	83.7	81.2	80.3	73.1	66.7	69.2	71.6	72.8	72.7	74.8	79.4	81.8	75.6
Saint Vincent, Minn.	92.8	85.3	85.1	77.5	69.2	73.5	77.5	80.2	77.8	78.8	82.5	88.9	80.6
Sismarek, Dak.	83.5	82.2	78.9	71.3	61.9	70.7	67.0	65.7	67.4	70.5	77.8	79.9	72.8
Bnford, Fort, Dak.	75.4	75.2	77.9	70.4	62.7	66.9	66.8	62.4	64.4	68.4	75.4	75.9	70.3
<b>Northern Slope:</b>													
Assinaboline, Fort, Mont.	65.0	67.0	66.7	59.0	54.8	55.8	52.1	51.7	57.5	63.0	64.5	62.8	60.0
Benton, Fort, Mont.	69.7	73.3	65.9	63.6	64.0	59.8	49.3	48.9	57.4	61.8	60.5	62.1	61.4
Custer, Fort, Mont.	73.8	73.0	68.4	61.2	66.0	65.0	51.3	44.4	53.1	60.9	63.9	62.1	62.3
Helena, Mont.	76.2	71.6	68.6	61.9	55.9	57.3	51.8	45.5	54.3	63.4	63.3	63.6	62.4
Maginnis, Fort, Mont.	53.3	48.0	47.2	49.8	53.2	49.0	47.4	47.2	53.9	60.4	52.2	52.4	51.1
Shaw, Fort, Mont.	71.8	69.0	62.0	58.9	55.7	57.8	52.2	51.9	58.7	63.7	62.3	63.1	60.6
Deadwood, Dak.	69.2	68.3	69.0	70.2	66.7	65.9	64.2	60.0	60.3	61.9	64.6	67.3	66.0
Cheyenne, Wyo.	51.3	52.4	48.9	52.8	53.5	51.2	49.2	51.4	41.5	50.6	48.9	54.0	50.7
North Platte, Nebr.	60.1	66.1	64.4	60.6	65.3	68.4	67.4	64.9	62.9	66.6	62.3	70.6	65.9
<b>Middle Slope:</b>													
Denver, Colo.	53.6	55.8	49.5	50.0	53.5	47.9	47.3	49.4	48.6	51.5	53.3	58.4	51.2
Pike's Peak, Colo.	71.3	72.5	74.2	77.7	77.0	68.9	69.2	73.4	71.9	75.3	68.1	74.9	73.3
West Las Animas, Colo.	66.8	63.3	47.7	47.6	54.9	55.6	49.5	53.6	47.5	55.5	57.8	66.7	67.1
Dodge City, Kans.	63.4	61.9	55.7	50.3	65.1	63.8	63.8	66.4	59.9	69.0	61.7	65.7	62.6
Elliott, Fort, Tex.	47.3	52.5	45.4	45.5	55.2	52.4	52.9	54.8	54.1	63.5	53.2	51.8	52.7
<b>Southern Slope:</b>													
Sill, Fort, Ind. T.	66.0	65.1	63.2	54.1	67.8	65.1	63.4	61.3	64.9	71.5	67.3	68.2	64.9
Concho, Fort, Tex.	69.8	68.0	60.6	58.1	63.7	60.1	61.1	62.8	70.5	75.8	69.9	69.7	66.3
Davis, Fort, Tex.	58.2	50.3	47.0	43.8	49.9	47.2	55.6	59.5	66.0	58.9	58.6	55.8	55.5
Stockton, Fort, Tex.	57.3	54.9	53.9	49.8	48.6	59.0	62.9	66.0	71.7	71.5	69.0	58.1	61.9
<b>Southern Plateau:</b>													
Santa Fé, N. Mex.	56.8	53.4	45.0	36.8	32.6	28.9	46.7	55.3	47.2	48.0	55.7	56.0	44.7
El Paso, Tex.	52.0	49.5	37.7	31.5	32.4	34.2	45.9	53.7	54.2	55.8	50.0	55.6	48.9
Apache, Fort, Ariz.	61.0	62.1	60.4	48.9	42.1	37.5	57.0	67.1	57.4	56.4	55.0	62.3	55.7
Grant, Fort, Ariz.	49.0	48.8	42.9	29.1	23.7	25.0	47.1	57.6	44.6	42.3	41.0	50.2	42.1
Prescott, Ariz.	50.4	58.9	53.3	44.0	36.2	31.0	52.3	59.4	48.6	48.7	50.7	61.0	50.2
Thomas, Camp, Ariz.	65.4	63.5	56.5	39.9	35.5	34.2	47.1	55.9	50.1	49.8	56.2	60.0	52.1
Yuma, Ariz.	45.4	45.6	44.9	41.9	38.1	40.0	43.8	48.2	44.3	46.2	43.0	50.9	43.4

*Mean relative humidity at stations of the Signal Service, United States Army, for each month and the year, &c.—Continued.*

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
<b>Middle Plateau:</b>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>
Winnemucca, Nev. ....	62.4	63.2	54.0	51.5	41.0	31.6	24.4	20.6	30.6	48.7	57.1	66.5	48.6
Salt Lake City, Utah. ....	52.1	54.1	48.4	50.7	41.2	33.0	30.5	34.0	35.5	46.6	48.6	53.4	44.0
<b>Northern Plateau:</b>													
Boisé City, Idaho. ....	78.2	76.7	67.3	64.0	56.6	49.6	44.2	43.3	51.8	64.9	70.6	79.0	61.4
Lewiston, Idaho. ....	68.5	67.8	62.8	62.4	59.6	60.2	44.4	43.1	53.4	67.9	74.4	75.9	61.7
Dayton, Wash. ....	61.0	70.4	70.0	65.6	61.8	59.1	52.5	50.6	58.0	69.5	80.5	81.8	67.3
Spokane Falls, Wash. ....	61.6	80.8	75.4	66.5	58.4	58.7	51.1	50.4	62.0	75.4	79.4	78.2	68.4
<b>North Pacific Coast:</b>													
Canby, Fort, Wash. ....	81.8	78.7	83.2	85.1	81.8	86.9	83.9	82.9	86.7	87.6	88.6	86.8	84.5
Olympia, Wash. ....	84.6	83.8	80.9	79.0	72.7	70.6	67.6	71.0	78.9	83.2	85.9	85.4	79.5
Tatoosh Island, Wash. ....	84.7	81.4	81.0	88.0	83.5	67.1	89.2	92.2	89.8	88.8	90.2	83.1	85.6
Portland, Oreg. ....	81.3	79.4	74.5	70.5	68.5	66.5	64.9	67.9	73.8	82.4	80.5	81.4	74.0
Roseburg, Oreg. ....	83.2	80.3	73.6	71.4	64.0	64.9	60.0	61.9	66.2	79.0	84.6	84.5	72.3
<b>Middle Pacific Coast:</b>													
Cape Mendocino, Cal. ....	79.7	77.6	82.0	84.6	85.3	83.7	88.7	87.6	79.1	82.8	79.6	79.4	82.4
Red Bluff, Cal. ....	71.5	68.6	59.0	65.6	52.4	42.2	34.0	35.3	45.3	55.8	62.1	77.0	55.8
Sacramento, Cal. ....	78.9	74.7	68.4	70.7	64.1	61.6	56.8	58.3	57.9	66.6	69.4	83.1	67.4
San Francisco, Cal. ....	75.6	73.5	73.6	77.0	73.8	78.0	79.5	82.0	78.7	77.0	72.1	79.9	76.8
<b>South Pacific Coast:</b>													
Los Angeles, Cal. ....	62.7	65.0	72.5	72.7	71.3	70.4	70.8	70.6	68.9	67.9	61.4	67.1	68.2
San Diego, Cal. ....	66.6	68.5	74.8	74.0	73.3	74.5	75.6	76.5	75.3	71.2	64.6	69.6	71.9
<b>Alaska Stations:</b>													
Saint Michael's, Ft., Alaska	97.5	97.7	96.4	95.4	92.9	85.1	83.2	86.7	87.9	89.5	93.0	94.0	91.4
Sitka, Alaska. ....	75.2	74.5	71.8	68.6	74.9	77.0	79.5	79.6	81.4	75.2	77.6	75.8	75.8
Unalashka, Alaska. ....	86.2	85.9	82.8	80.3	77.7	78.0	77.8	81.8	77.8	79.0	80.0	81.4	79.5
Behring's Island, Behring Sea. ....	83.3	84.3	87.4	90.1	88.5	87.6	91.6	92.6	85.2	85.2	89.0	86.4	87.7

## APPENDIX 38.

Mean relative humidity at stations of the Signal Service, United States Army, for each month and the year, computed from the 7 a. m., 3 and 11 p. m. (Washington time) observations, and from January 1, 1882, to December 31, 1884.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
<b>New England:</b>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>
Eastport, Me. ....	74.3	75.6	72.7	73.5	73.3	73.4	79.3	76.3	76.3	74.7	74.6	77.1	75.1
Portland, Me. ....	71.7	69.3	63.2	61.9	63.2	66.2	69.6	71.0	71.9	70.3	68.8	73.7	68.4
Mount Washington, N. H. ....	83.3	87.2	89.2	89.6	89.8	83.5	92.4	89.5	87.7	88.0	87.0	86.2	87.8
Boston, Mass. ....	73.2	74.7	69.9	72.0	72.2	70.4	71.1	72.4	74.3	73.4	70.8	73.8	72.4
Block Island, R. I. ....	76.4	77.6	73.7	78.6	82.1	83.3	82.1	82.3	82.3	78.9	77.1	80.1	79.5
New Haven, Conn. ....	73.5	74.1	67.6	67.1	69.0	70.9	72.9	74.1	75.3	74.4	70.9	75.9	72.1
New London, Conn. ....	73.0	76.7	71.7	70.2	70.9	74.9	75.9	77.4	78.6	79.2	72.7	74.4	74.7
<b>Middle Atlantic States:</b>													
Albany, N. Y. ....	65.2	65.7	63.0	56.9	57.5	60.5	63.8	62.7	67.4	65.3	63.0	69.1	63.4
New York City ....	78.0	78.2	71.2	68.1	69.3	70.8	71.5	71.1	73.5	72.6	71.7	78.3	72.7
Philadelphia, Pa. ....	76.6	78.2	69.0	73.9	78.9	75.4	73.5	76.8	74.9	74.0	69.2	73.7	74.1
Atlantic City, N. J. ....	75.7	78.9	76.1	77.6	78.4	81.1	79.1	80.7	80.1	79.6	78.5	77.7	78.5
Barnegat City, N. J. ....	80.3	82.0	73.8	74.4	78.1	79.7	79.3	81.1	81.7	81.2	77.0	78.8	78.9
Cape May, N. J. ....	73.8	77.4	76.0	77.1	77.2	79.6	80.5	79.9	78.5	78.9	73.2	77.9	77.8
Sandy Hook, N. J. ....	77.8	79.7	74.9	74.2	72.9	73.8	71.9	74.0	74.9	73.3	73.0	76.9	74.7
Delaware Breakwater, Del. ....	64.8	62.2	79.3	79.5	78.5	81.5	79.8	78.9	80.5	79.7	77.1	79.2	80.1
Baltimore, Md. ....	70.7	67.3	63.0	61.5	62.3	64.8	65.8	69.3	69.8	70.3	64.1	67.2	66.3
Washington City ....	80.1	74.9	69.4	68.1	67.3	68.7	69.4	72.7	73.8	74.4	70.1	75.4	72.1
Cape Henry, Va. ....	81.3	77.3	72.9	74.7	72.8	76.4	76.8	78.9	78.2	77.9	79.0	73.0	76.1
Chincoteague, Va. ....	83.8	80.0	76.3	77.4	79.2	83.6	82.2	83.4	81.4	81.4	76.9	78.8	84.4
Lynchburg, Va. ....	67.2	68.2	67.9	63.4	62.1	68.0	63.7	67.4	69.9	70.0	62.2	66.2	65.0
Norfolk, Va. ....	75.6	71.4	66.8	69.8	69.4	71.6	74.1	76.6	77.4	78.7	70.6	72.2	72.9
<b>South Atlantic States:</b>													
Charlotte, N. C. ....	76.7	71.8	63.9	64.7	62.6	67.1	64.1	68.1	72.0	71.5	64.9	70.1	68.1
Hatteras, N. C. ....	85.6	81.1	77.8	80.0	80.1	82.9	81.4	82.9	82.1	84.3	79.6	82.9	81.7
Kitty Hawk, N. C. ....	81.5	77.7	73.5	78.1	78.1	79.6	78.4	81.0	80.2	80.6	74.7	76.7	78.4
Macon, Fort, N. C. ....	83.5	82.2	76.6	81.4	79.7	83.2	81.1	83.4	83.4	83.7	79.0	79.9	81.4
Smithville, N. C. ....	82.0	81.2	76.3	79.7	76.8	79.0	77.9	81.2	82.1	80.2	74.6	78.7	79.2
Wilmington, N. C. ....	78.0	71.6	67.6	70.5	70.8	75.1	77.1	78.4	79.7	77.0	68.3	72.4	73.6
Charleston, S. C. ....	79.9	78.0	74.5	76.5	73.8	77.5	77.8	79.6	82.1	80.8	75.0	80.0	78.0
Augusta, Ga. ....	71.9	68.5	63.4	66.5	65.3	68.2	69.2	71.1	72.0	70.3	67.0	71.2	69.1
Savannah, Ga. ....	71.1	68.9	61.9	67.2	66.2	72.6	70.4	74.8	76.1	75.3	66.9	69.9	70.1
Jacksonville, Fla. ....	77.1	74.1	68.1	72.1	69.6	75.2	74.7	77.1	78.7	78.5	77.2	79.8	75.2
<b>Florida Peninsula:</b>													
Cedar Key, Fla. ....	81.1	75.1	74.5	73.5	69.7	75.4	74.6	75.5	74.1	76.7	76.6	81.8	75.7
Key West, Fla. ....	79.6	75.9	71.7	70.2	69.6	71.7	70.1	72.1	75.9	79.0	80.5	82.0	74.9
<b>Eastern Gulf States:</b>													
Atlanta, Ga. ....	75.6	69.5	64.2	64.0	62.6	71.7	68.4	73.6	68.1	70.3	62.4	69.7	68.3
Pensacola, Fla. ....	77.3	79.0	75.8	76.4	74.3	79.7	79.3	79.2	76.0	74.8	69.0	77.2	76.5
Mobile, Ala. ....	73.5	75.5	72.7	72.5	70.9	74.7	76.4	75.4	73.2	74.1	76.9	78.7	75.0
Montgomery, Ala. ....	74.2	69.3	65.8	67.3	63.7	72.4	71.4	73.4	67.1	66.7	69.4	73.9	69.6
Vicksburg, Miss. ....	73.4	68.3	62.7	67.8	69.8	73.2	74.4	73.2	71.6	74.0	69.9	70.8	70.6
New Orleans, La. ....	73.4	71.9	69.4	71.8	70.4	74.0	71.7	71.8	70.9	73.9	68.2	72.2	71.8
<b>Western Gulf States:</b>													
Shreveport, La. ....	75.3	74.1	65.7	69.6	72.1	71.4	69.0	70.8	68.3	74.1	74.2	71.3	71.4
Little Rock, Ark. ....	73.7	75.1	65.1	70.1	74.3	76.9	77.9	76.9	77.7	80.7	74.5	73.0	74.7
Galveston, Tex. ....	84.1	81.9	79.6	77.9	75.8	75.5	75.0	74.1	73.3	77.3	78.8	79.4	77.5
Indianola, Tex. ....	83.2	81.9	81.8	80.5	78.8	79.5	79.2	77.3	79.3	80.8	78.6	82.2	80.3
<b>Rio Grande Valley:</b>													
Brownsville, Tex. ....	81.0	80.8	81.9	78.7	79.2	79.6	78.7	75.6	78.9	81.0	79.8	79.2	79.8
<b>Ohio Valley and Tennessee:</b>													
Chattanooga, Tenn. ....	74.3	70.6	63.2	65.4	67.3	74.2	72.6	78.1	73.3	76.3	69.6	70.4	71.6
Knoxville, Tenn. ....	80.9	73.8	66.9	65.1	67.7	74.4	75.4	75.4	77.0	76.6	71.5	76.1	73.1
Memphis, Tenn. ....	78.0	74.9	64.3	65.3	67.5	73.1	71.1	72.6	71.6	76.5	72.2	73.0	71.7
Nashville, Tenn. ....	79.2	73.3	66.9	66.3	66.4	73.3	73.9	74.1	72.1	74.5	78.5	76.5	72.5
Louisville, Ky. ....	73.4	69.3	63.3	60.9	69.8	73.9	70.4	70.1	71.4	74.7	69.5	71.5	70.5
Indianapolis, Ind. ....	72.6	72.5	64.2	61.0	63.2	66.8	65.9	67.2	67.7	71.8	70.5	75.8	68.3
Cincinnati, Ohio. ....	78.0	75.2	66.8	64.6	65.3	68.0	63.5	64.1	66.7	71.3	73.0	75.8	69.3
Columbus, Ohio. ....	74.1	72.0	65.4	64.0	65.4	68.1	64.0	65.5	68.7	72.1	70.4	74.2	68.7
Pittsburg, Pa. ....	79.0	74.7	68.8	62.5	65.6	68.2	68.3	70.3	69.9	71.8	70.5	79.1	76.7
<b>Lower Lakes:</b>													
Buffalo, N. Y. ....	83.7	81.8	76.9	73.4	72.4	72.4	74.9	72.1	76.5	75.9	76.7	78.0	76.2
Oswego, N. Y. ....	67.7	71.4	71.9	69.1	69.8	72.8	73.4	71.3	73.3	70.9	70.0	73.9	71.3

*Mean relative humidity at stations of the Signal Service, &c.—Continued.*

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
<b>Lower Lakes—Continued:</b>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>
Erie, Pa.	80.0	79.1	74.6	71.3	69.7	70.5	72.1	71.6	72.7	74.8	74.0	78.6	74.1
Cleveland, Ohio	80.6	78.9	74.2	66.3	67.2	67.8	67.6	69.8	69.6	68.7	72.0	80.2	71.9
Toledo, Ohio	74.0	73.1	66.5	62.6	63.2	68.5	65.3	69.6	70.2	70.5	68.7	73.5	69.0
Detroit, Mich.	75.8	76.1	73.3	64.2	66.4	69.3	67.9	70.1	71.6	70.1	71.3	75.6	71.0
<b>Upper Lakes:</b>													
Alpena, Mich.	75.6	75.5	74.6	68.3	69.1	74.7	73.5	76.9	76.6	75.7	81.9	80.7	75.2
Escanaba, Mich.	77.1	75.2	73.0	68.6	66.9	71.8	73.1	77.6	78.2	74.8	75.4	77.5	74.1
Grand Haven, Mich.	80.8	80.6	77.7	65.3	67.9	73.2	74.8	78.1	75.9	75.4	76.1	81.0	75.6
Marquette, Mich.	67.1	67.7	67.2	66.6	62.5	66.4	69.1	73.2	72.4	69.5	71.3	73.3	68.8
Port Huron, Mich.	83.5	83.4	80.2	75.6	73.9	75.0	76.0	76.4	76.3	76.9	82.4	84.5	78.7
Chicago, Ill.	74.6	71.6	69.1	68.0	68.7	74.7	69.3	71.3	69.0	72.5	72.4	74.8	71.4
Milwaukee, Wis.	79.6	78.1	75.7	70.3	69.7	76.4	73.4	76.7	76.5	73.6	74.6	80.2	75.4
Duluth, Minn.	76.3	72.5	70.6	68.0	66.6	72.3	70.7	77.1	75.6	73.6	75.6	77.0	73.0
<b>Upper Mississippi Valley:</b>													
Saint Paul, Minn.	79.6	72.3	69.1	62.2	63.6	71.7	72.6	72.4	72.0	70.6	70.9	73.0	70.8
La Crosse, Wis.	72.7	68.5	67.8	57.0	56.4	63.2	66.2	70.3	72.3	69.1	71.0	73.5	67.3
Davenport, Iowa	60.3	63.0	61.7	61.7	67.0	73.9	70.7	71.2	70.4	72.1	68.1	68.4	67.4
Des Moines, Iowa	66.2	66.5	66.7	62.8	63.2	73.6	72.7	72.3	69.6	71.9	67.9	69.6	69.0
Dubuque, Iowa	60.0	63.0	64.1	57.9	63.1	70.0	67.7	69.8	70.3	70.0	66.9	65.8	65.7
Keokuk, Iowa	76.1	72.8	69.9	64.6	68.1	74.0	69.7	70.7	68.9	72.9	72.1	76.0	71.4
Cauro, Ill.	79.4	76.1	68.8	65.9	69.4	76.8	76.2	74.9	75.1	77.0	72.2	74.6	73.9
Springfield, Ill.	72.0	71.0	65.1	61.6	66.3	73.7	67.9	69.1	66.5	71.2	67.2	72.1	68.6
Saint Louis, Mo.	78.3	79.4	75.6	71.5	77.9	79.1	75.1	77.1	71.2	79.3	76.3	77.5	76.5
<b>Missouri Valley:</b>													
Leavenworth, Kans.	71.1	67.0	63.4	61.0	64.7	70.3	68.7	71.0	65.0	70.6	68.6	74.4	68.0
Omaha, Nebr.	68.7	67.4	65.9	63.8	63.3	71.4	70.9	73.9	70.8	69.4	68.7	71.1	69.3
Bennett, Fort, Dak.	73.9	73.4	73.3	68.2	69.3	69.8	68.9	64.0	60.0	65.4	70.2	77.3	68.5
Huron, Dak.	64.2	67.0	70.4	70.3	71.2	73.8	75.5	74.8	69.5	68.9	69.0	67.0	70.1
Yankton, Dak.	66.2	67.3	68.0	66.9	67.1	70.8	71.3	71.5	67.4	68.0	69.2	70.7	68.7
<b>Extreme Northwest:</b>													
Moorhead, Minn.	88.8	83.4	82.5	78.2	65.7	67.7	72.6	71.7	71.2	74.6	77.9	83.3	76.1
Saint Vincent, Minn.	92.2	83.4	84.7	77.9	69.3	73.2	79.1	81.1	77.5	79.6	80.9	86.8	80.5
Bismarck, Dak.	80.7	79.5	76.7	71.3	63.0	69.9	69.3	67.1	67.3	73.6	74.8	78.8	72.9
Buford, Fort, Dak.	78.1	73.1	74.4	69.8	62.6	65.0	66.0	61.3	62.9	71.6	77.7	78.8	70.3
<b>Northern Slope:</b>													
Aassinaboma, Fort, Mont.	64.9	66.0	68.3	61.8	58.0	55.8	51.9	50.9	57.1	60.4	61.2	60.5	60.0
Benton, Fort, Mont.	62.9	67.1	67.2	59.7	60.5	60.3	49.8	48.8	59.8	60.6	54.6	62.5	59.7
Helena, Mont.	78.5	75.2	68.7	65.4	58.2	58.7	54.0	44.7	54.3	64.0	66.8	61.0	62.9
Shaw, Fort, Mont.	67.4	67.9	63.9	61.1	59.6	58.4	50.7	50.5	59.9	62.8	59.0	61.8	60.0
Deadwood, Dak.	73.9	74.6	75.8	77.9	75.5	71.4	69.1	64.8	62.6	64.2	66.9	74.5	61.2
Cheyenne, Wyo.	66.0	62.8	49.0	57.4	59.5	59.1	47.7	50.3	40.6	51.2	45.9	56.9	52.2
North Platte, Nebr.	72.6	69.8	64.9	66.2	69.5	70.8	67.7	68.8	63.5	60.8	62.5	72.3	67.9
<b>Middle Slope:</b>													
Denver, Colo.	55.6	56.5	49.3	54.3	58.1	55.0	46.9	48.1	42.7	50.6	48.0	58.8	52.0
Pike's Peak, Colo.	73.1	79.2	79.7	82.8	86.1	80.9	69.5	74.4	75.9	81.5	73.0	81.7	73.6
Dodge City, Kans.	68.6	65.7	57.5	57.1	66.0	69.8	63.3	69.0	61.2	67.3	62.8	60.0	64.8
Elliott, Fort, Tex.	54.3	54.5	52.0	50.3	59.5	63.9	59.5	68.6	60.6	69.6	61.3	65.0	59.6
<b>Southern Slope:</b>													
Concho, Fort, Tex.	71.3	73.8	66.6	57.5	63.9	64.5	59.7	59.9	68.7	75.2	72.8	70.3	67.1
Davis, Fort, Tex.	55.9	52.4	50.5	44.2	44.4	50.7	53.2	60.7	62.5	61.1	62.2	57.9	54.5
Stookton, Fort, Tex.	66.8	63.4	58.5	50.7	61.0	62.9	60.5	64.2	70.1	69.7	68.4	63.1	63.2
<b>Southern Plateau:</b>													
El Paso, Tex.	53.4	52.2	41.4	30.8	29.4	33.4	42.0	51.2	54.3	54.9	59.4	55.9	46.5
Apache, Fort, Ariz.	67.3	67.2	65.1	51.0	48.1	44.9	54.5	65.6	58.9	55.0	68.7	67.7	58.5
Grant, Fort, Ariz.	53.5	59.4	47.8	32.5	29.7	30.8	42.4	56.1	42.7	44.2	54.7	56.1	45.2
Prescott, Ariz.	57.4	63.7	59.0	48.0	42.2	38.5	53.1	58.7	47.3	61.5	64.3	63.8	53.1
Thomas, Camp, Ariz.	67.3	63.7	59.4	41.9	39.3	35.3	40.8	51.9	46.5	46.8	59.4	67.9	52.1
<b>Middle Plateau:</b>													
Salt Lake City, Utah	56.0	54.2	51.4	54.3	43.1	36.7	31.6	36.8	39.6	54.1	51.9	58.4	47.3
<b>Northern Plateau:</b>													
Lewiston, Idaho	71.1	68.9	65.8	61.4	56.8	53.2	44.1	43.2	55.2	70.4	75.6	77.5	61.9
Dayton, Wash.	81.3	75.2	72.3	65.8	59.8	58.7	50.6	48.4	57.0	71.2	81.5	83.2	67.1
Spokane Falls, Wash.	81.6	79.0	77.1	69.2	61.5	58.0	49.8	43.2	60.4	75.0	80.2	80.3	68.4
<b>North Pacific Coast:</b>													
Olympia, Wash.	83.4	80.8	80.2	79.7	72.7	69.0	65.8	68.6	78.1	83.2	85.1	84.1	77.5
Portland, Oreg.	81.6	77.6	74.5	71.1	63.7	65.5	65.5	66.6	74.8	82.8	82.8	81.9	74.0
<b>Middle Pacific Coast:</b>													
Red Bluff, Cal.	71.9	68.4	65.1	63.3	53.0	45.6	34.7	35.4	49.2	59.7	69.7	73.6	57.5
Sacramento, Cal.	77.7	74.0	70.6	68.3	65.1	62.9	57.2	58.6	60.1	71.6	75.7	80.7	68.6
San Francisco, Cal.	76.0	71.6	75.7	75.6	74.7	73.8	79.5	83.1	73.8	79.7	79.7	77.8	77.5
<b>South Pacific Coast:</b>													
Los Angeles, Cal.	61.5	65.1	73.8	73.2	71.2	72.2	70.8	76.0	68.8	68.0	63.2	65.3	68.6
San Diego, Cal.	64.3	67.7	75.0	74.1	73.6	75.1	76.0	77.1	75.1	71.9	69.8	68.8	72.4
<b>Alaska Stations:</b>													
Saint Michael's, Ft., Alaska	93.1	96.5	95.2	93.6	90.0	83.5	83.6	85.7	87.4	89.0	92.6	92.5	90.5
Sitka, Alaska	75.2	74.5	71.8	67.1	73.1	75.9	79.0	80.8	80.7	75.7	76.0	74.3	75.3

## APPENDIX 39.

*Average dew-point (in degrees Fahrenheit) at stations of the Signal Service, United States Army, for each month and the year. (Computed from January, 1882, to and including December, 1884.)*

[The daily means are obtained by dividing the sum of 7 a. m., 3 and 11 p. m. (Washington time) observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
<b>New England:</b>	°	°	°	°	°	°	°	°	°	°	°	°	°
Eastport, Me.	11.2	16.0	19.2	29.6	37.2	47.7	53.1	53.4	48.0	38.4	29.4	18.6	33.5
Portland, Me.	14.8	19.3	21.1	31.4	40.1	53.4	58.4	57.8	51.7	40.8	30.3	21.5	36.7
Mount Washington, N. H.	-0.4	5.5	5.6	18.0	28.2	40.4	43.7	43.3	37.0	27.0	14.0	7.0	22.5
Boston, Mass.	17.8	22.7	24.1	33.5	43.0	55.9	59.3	58.2	53.4	42.3	31.1	23.1	38.6
Block Island, R. I.	23.9	27.6	27.7	36.2	45.8	57.7	62.0	62.2	58.1	48.1	37.6	29.8	43.1
New Haven, Conn.	16.8	22.3	23.0	32.7	43.2	56.2	60.2	59.2	54.9	43.7	30.9	22.9	38.8
New London, Conn.	19.5	25.7	26.7	35.2	44.3	57.2	61.4	61.0	56.9	47.3	33.8	24.9	41.2
<b>Middle Atlantic States:</b>													
Albany, N. Y.	14.5	21.0	21.2	31.7	41.9	55.6	58.6	57.5	52.8	40.6	29.3	20.9	37.3
New York City	21.8	27.6	27.9	35.8	45.9	57.9	61.6	60.4	56.9	46.4	34.1	26.5	41.9
Philadelphia, Pa.	23.5	30.5	31.0	40.6	53.1	63.2	65.3	64.3	59.0	48.6	34.8	27.9	45.2
Atlantic City, N. J.	23.9	30.5	30.9	39.3	48.8	60.5	64.9	64.9	61.2	51.5	37.2	29.5	45.3
Barnegat City, N. J.	25.2	31.2	30.1	37.9	48.5	59.9	64.7	64.8	61.3	51.8	39.0	30.4	45.3
Cape May, N. J.	27.8	33.3	34.0	41.6	50.7	61.5	63.6	65.7	61.7	52.6	39.0	33.0	47.3
Sandy Hook, N. J.	23.0	29.1	29.9	38.3	47.7	59.8	63.2	63.0	59.0	48.2	35.8	28.3	43.8
Delaware Breakwater, Del.	28.0	34.0	33.7	40.8	50.5	61.7	65.6	66.0	62.4	53.5	39.9	32.0	47.4
Baltimore, Md.	24.0	30.2	30.0	38.0	48.2	60.2	63.8	62.4	57.9	49.1	34.0	27.3	43.7
Washington City	24.9	31.6	30.9	39.4	50.0	61.5	63.8	63.1	59.0	49.9	35.3	28.1	44.8
Cape Henry, Va.	32.8	39.0	37.0	44.5	53.5	64.2	67.8	68.4	64.7	56.5	42.2	35.4	50.5
Chincoteague, Va.	29.8	35.1	34.3	41.4	52.3	64.2	67.8	67.4	63.5	55.0	40.5	32.9	48.7
Lynchburg, Va.	25.1	32.2	30.7	41.4	51.0	61.9	62.6	61.9	57.5	50.0	32.8	27.7	44.6
Norfolk, Va.	32.5	39.0	37.0	44.6	54.3	64.4	68.6	68.0	64.0	56.3	41.7	35.0	50.5
<b>South Atlantic States:</b>													
Charlotte, N. C.	32.7	39.6	37.6	45.3	52.9	62.2	64.4	63.7	60.2	53.2	37.4	32.9	49.5
Hatteras, N. C.	40.1	45.0	43.4	49.5	58.8	68.4	71.6	71.3	68.1	61.3	48.3	42.7	55.7
Kitty Hawk, N. C.	35.5	41.1	38.9	45.4	55.7	65.8	69.7	69.5	66.3	58.7	44.7	38.3	52.5
Macon, Fort, N. C.	39.3	45.5	44.4	51.8	60.7	69.0	72.4	71.9	68.3	61.3	47.5	41.2	50.1
Smithville, N. C.	40.6	46.8	45.5	53.3	61.1	68.7	72.5	71.6	67.8	60.1	45.5	41.7	50.3
Wilmington, N. C.	39.5	45.3	43.7	50.7	58.9	66.9	71.4	70.6	66.6	59.2	44.2	39.0	54.7
Charleston, S. C.	44.4	50.1	49.5	56.2	62.9	70.3	74.1	72.8	69.8	63.1	49.2	46.2	59.0
Augusta, Ga.	38.8	44.7	43.9	51.2	57.6	66.8	68.9	68.2	65.7	57.5	42.7	39.6	53.8
Savannah, Ga.	42.9	47.5	46.2	54.5	60.7	68.7	71.4	70.8	67.4	60.9	45.9	43.7	56.7
Jacksonville, Fla.	49.5	53.0	52.2	59.4	63.5	70.5	73.2	72.2	69.6	65.5	53.5	50.7	61.1
<b>Florida Peninsula:</b>													
Cedar Key, Fla.	51.4	55.4	55.9	62.1	64.6	71.2	73.4	73.1	70.2	66.6	55.6	53.4	62.7
Key West, Fla.	64.3	65.4	64.0	67.0	69.0	73.0	73.8	74.1	73.9	71.8	67.7	65.3	69.1
<b>Eastern Gulf States:</b>													
Atlanta, Ga.	34.2	40.1	40.1	47.3	53.5	63.6	65.3	65.1	59.8	54.9	37.9	34.3	49.7
Pensacola, Fla.	45.8	52.1	53.0	59.8	63.6	71.6	72.9	72.6	68.6	63.4	47.8	46.9	59.8
Mobile, Ala.	44.4	49.8	51.4	58.0	62.2	70.5	71.8	70.6	67.0	62.6	49.1	45.8	58.0
Montgomery, Ala.	39.9	45.7	45.5	53.0	57.3	67.4	69.3	68.8	63.0	57.3	43.7	40.9	54.3
Vicksburg, Miss.	38.6	45.0	46.3	54.2	60.1	69.1	71.2	69.1	65.0	60.4	45.7	41.4	55.5
New Orleans, La.	46.4	51.8	53.3	59.8	64.0	70.9	72.4	71.3	68.3	64.8	50.4	48.0	60.1
<b>Western Gulf States:</b>													
Shreveport, La.	36.1	43.7	46.7	54.1	61.1	69.1	70.8	68.6	63.2	59.4	46.0	38.9	54.8
Little Rock, Ark.	32.0	40.6	42.5	51.8	58.4	69.0	71.5	68.5	64.3	59.5	44.7	35.8	53.2
Galveston, Tex.	47.2	53.4	58.0	62.4	66.9	73.1	75.0	73.8	70.7	67.7	55.4	51.6	62.9
Indianola, Tex.	46.1	53.6	59.5	63.7	68.2	73.8	75.4	74.0	71.7	68.8	57.1	50.9	63.6
Palestine, Tex.	31.4	39.8	47.4	54.4	61.6	69.1	71.5	67.5	63.5	59.3	46.0	38.5	54.1
<b>Rio Grande Valley:</b>													
Brownsville, Tex.	50.4	57.2	62.5	65.7	70.2	74.1	74.8	72.8	70.7	69.5	59.9	54.7	65.2
<b>Ohio Valley and Tennessee:</b>													
Chattanooga, Tenn.	32.3	39.2	38.8	47.2	53.9	64.8	66.3	66.3	62.7	56.1	39.3	33.0	50.0
Knoxville, Tenn.	30.9	37.7	36.3	44.2	52.1	63.0	64.9	63.0	59.4	54.4	37.1	31.1	47.9
Memphis, Tenn.	31.8	39.8	39.8	48.8	56.1	67.5	69.1	66.7	61.9	57.6	42.7	34.8	51.4
Nashville, Tenn.	31.0	38.7	38.4	46.8	53.8	65.4	67.2	65.4	61.0	55.5	40.7	33.6	49.8
Louisville, Ky.	25.4	33.5	33.3	41.6	53.0	64.3	64.8	62.6	59.1	52.9	38.1	29.8	46.5
Indianapolis, Ind.	18.2	28.0	28.6	38.1	46.8	59.7	60.9	59.5	54.5	47.4	33.6	24.5	41.7
Cincinnati, Ohio	25.4	34.4	33.5	41.6	49.6	61.8	61.7	60.2	57.0	50.5	37.4	29.5	45.2
Columbus, Ohio	19.1	28.8	28.2	37.1	46.5	58.6	59.5	57.8	54.6	47.2	32.6	25.0	41.2
Pittsburg, Pa.	22.9	39.4	29.0	36.6	47.1	58.8	59.6	57.3	54.8	47.2	34.0	28.1	42.3
<b>Lower Lakes:</b>													
Buffalo, N. Y.	17.4	22.4	22.5	31.6	41.0	54.3	58.0	57.5	53.6	43.8	32.5	24.2	38.2
Oswego, N. Y.	14.3	21.1	22.8	31.4	41.5	55.2	58.0	57.7	52.1	41.7	30.2	21.7	37.3
Erie, Pa.	19.4	25.5	25.7	34.2	43.6	56.4	59.0	58.6	53.9	46.5	33.9	26.4	40.2

*Average dew-point (in degrees Fahrenheit) at stations of the Signal Service, United States Army, &c.—Continued.*

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
<b>Lower Lakes—Continued:</b>													
Cleveland, Ohio.....	17.9	25.1	25.5	32.4	42.9	55.6	57.6	57.4	52.6	43.7	31.6	24.2	38.9
Toledo, Ohio.....	17.2	24.5	25.2	33.6	44.2	58.0	59.1	59.3	54.2	45.1	32.0	23.8	39.6
Detroit, Mich.....	18.1	25.4	27.3	33.5	43.3	57.3	58.5	58.6	54.0	44.8	33.2	24.7	39.9
<b>Upper Lakes:</b>													
Alpena, Mich.....	9.8	13.2	15.9	26.1	35.2	50.5	53.4	54.9	49.1	39.0	28.4	18.4	32.8
Escanaba, Mich.....	6.6	9.8	14.8	26.3	35.5	50.6	54.3	55.4	49.8	39.1	25.7	15.0	31.9
Grand Haven, Mich.....	18.1	22.9	25.2	32.0	41.3	54.9	58.4	59.0	53.4	44.1	32.6	24.0	38.8
Marquette, Mich.....	5.2	8.4	13.0	25.5	32.5	45.3	50.6	53.0	47.3	36.7	24.3	14.4	29.7
Port Huron, Mich.....	14.7	20.9	22.9	31.8	40.7	54.3	57.1	57.8	52.6	42.7	31.6	22.0	37.4
Chicago, Ill.....	14.5	21.3	25.1	34.4	42.7	55.5	58.5	59.1	54.0	45.6	32.3	21.1	38.7
Milwaukee, Wis.....	11.9	19.8	24.3	32.6	40.1	53.4	56.9	58.6	53.2	43.8	30.0	19.0	36.9
Duluth, Minn.....	1.8	7.8	15.8	27.8	35.1	48.6	52.9	55.5	48.7	38.0	24.0	8.3	30.3
<b>Upper Mississippi Valley:</b>													
Saint Paul, Minn.....	4.2	10.2	18.7	32.4	41.6	56.0	58.7	58.8	50.7	39.7	24.2	9.5	33.8
La Crosse, Wis.....	5.7	14.0	21.0	32.1	39.7	55.0	58.0	58.8	53.1	41.6	27.5	13.2	35.0
Davenport, Iowa.....	9.2	19.1	24.8	37.2	46.2	59.8	61.2	60.1	54.2	45.5	31.2	18.8	39.0
Des Moines, Iowa.....	8.1	15.8	24.8	37.1	45.2	58.9	61.1	59.6	52.5	43.5	28.4	14.6	37.4
Dubuque, Iowa.....	4.1	14.1	22.0	33.1	42.3	56.8	58.4	58.1	52.2	42.5	27.3	13.7	35.4
Keokuk, Iowa.....	14.7	22.0	28.5	39.9	48.0	61.5	63.1	61.3	54.9	40.6	28.9	20.6	41.1
Cairo, Ill.....	27.0	35.8	37.3	46.4	54.0	66.9	68.6	65.8	61.3	54.7	39.9	30.8	49.0
Springfield, Ill.....	16.6	25.7	29.5	39.6	47.8	61.7	59.8	63.8	57.2	43.2	33.2	22.9	41.6
Saint Louis, Mo.....	21.0	30.6	35.0	45.3	54.1	65.2	66.5	65.2	58.9	52.7	39.3	28.2	46.8
<b>Missouri Valley:</b>													
Leavenworth, Kans.....	16.0	22.3	29.6	39.4	47.2	61.2	63.7	61.7	54.1	46.5	32.9	22.6	41.4
Omaha, Nebr.....	10.4	15.9	25.5	37.6	46.9	60.2	63.1	62.0	54.0	43.0	29.5	15.0	36.7
Bennett, Fort, Dak.....	5.0	9.1	21.5	33.0	42.7	56.5	57.7	56.1	44.7	34.0	21.8	10.0	32.7
Huron, Dak.....	-0.1	5.6	19.1	33.6	42.5	56.7	58.4	58.0	47.4	36.5	21.6	5.2	32.0
Yankton, Dak.....	5.2	12.4	21.5	34.6	43.5	58.2	60.2	60.1	50.0	39.3	24.9	9.8	35.0
<b>Extreme Northwest:</b>													
Moorhead, Minn.....	-5.4	-1.1	11.5	30.2	38.4	52.5	55.0	54.9	45.7	34.8	18.5	2.0	28.3
Saint Vincent, Minn.....	-9.0	-4.9	6.7	27.5	38.0	52.1	54.4	56.0	45.4	34.1	18.3	-1.1	28.4
Bismarck, Dak.....	-0.6	4.1	14.7	30.1	38.3	54.5	54.6	54.8	45.0	34.6	21.7	4.4	29.7
Buford, Fort, Dak.....	-0.6	1.5	15.1	29.7	38.5	51.8	52.1	51.7	40.3	32.4	19.9	3.3	27.9
<b>Northern Slope:</b>													
Aasinsabine, Fort, Mont.....	2.1	2.6	16.1	27.4	36.2	45.5	45.1	45.7	36.5	27.9	18.3	5.1	25.7
Benton, Fort, Mont.....	5.6	7.9	21.9	27.7	38.1	48.3	46.9	47.6	39.6	20.2	17.7	6.1	28.0
Helena, Mont.....	8.5	10.7	21.7	29.4	35.8	45.9	47.3	44.6	38.5	30.0	22.8	12.4	29.0
Shaw, Fort, Mont.....	8.5	7.9	17.5	25.5	34.0	43.8	41.2	43.1	36.0	27.8	19.3	7.8	26.1
Deadwood, Dak.....	13.4	13.3	23.1	30.0	38.3	49.4	51.4	50.0	40.5	32.0	23.5	14.1	31.6
Cheyenne, Wyo.....	7.8	9.2	14.3	21.9	31.4	42.4	43.0	40.5	27.7	23.8	18.2	11.3	23.5
North Platte, Nebr.....	12.0	14.1	24.6	34.2	44.1	57.5	59.7	57.0	48.5	38.2	23.9	15.0	35.8
<b>Middle Slope:</b>													
Denver, Colo.....	14.5	14.1	21.4	28.9	36.7	46.6	47.3	46.6	33.8	30.6	20.3	16.3	29.8
Pike's Peak, Colo.....	-4.6	-1.2	3.5	7.0	16.4	25.3	29.1	29.5	20.0	15.4	6.1	-2.0	12.6
Dodge City, Kans.....	16.1	18.8	26.5	34.1	45.6	59.7	61.0	60.2	51.2	42.4	27.1	18.8	33.5
Elliott, Fort, Tex.....	14.7	19.6	27.3	33.6	45.1	58.0	60.1	58.4	52.0	46.0	29.9	21.1	38.8
<b>Southern Slope:</b>													
Concho, Fort, Tex.....	31.8	39.2	44.0	44.3	55.0	64.3	62.0	62.2	60.1	56.1	43.2	33.6	48.7
Davis, Fort, Tex.....	24.5	29.2	32.0	29.9	39.2	50.6	55.2	54.1	51.5	44.7	35.3	28.0	39.5
Stockton, Fort, Tex.....	29.0	35.2	39.4	38.9	52.8	62.2	64.2	61.9	58.4	51.7	40.0	31.4	47.1
<b>Southern Plateau:</b>													
El Paso, Tex.....	23.9	29.4	18.2	24.5	31.4	43.7	54.9	56.3	50.5	41.5	34.5	27.4	37.2
Apache, Fort, Ariz.....	23.4	27.8	32.0	27.4	32.7	39.7	51.5	55.1	43.6	34.4	27.1	25.4	35.0
Grant, Fort, Ariz.....	24.1	29.4	29.2	24.0	29.0	38.4	50.4	54.8	43.9	36.3	30.3	28.4	34.9
Prescott, Ariz.....	19.0	24.4	28.0	24.8	29.3	36.2	51.4	52.0	38.6	31.0	24.6	24.2	31.9
Thomas, Camp, Ariz.....	29.7	35.4	37.7	31.3	37.0	43.1	54.7	58.7	49.1	38.2	35.1	32.4	40.2
<b>Middle Plateau:</b>													
Salt Lake City, Utah.....	12.0	13.3	24.3	29.7	33.0	39.2	40.7	45.2	37.2	31.8	22.3	21.3	29.1
<b>Northern Plateau:</b>													
Lewiston, Idaho.....	21.7	17.8	32.6	36.5	42.8	48.7	47.1	47.4	42.1	38.7	32.2	23.5	35.9
Dayton, Wash.....	24.2	17.9	32.8	35.3	41.5	47.8	46.3	45.6	41.1	37.7	33.4	24.1	35.6
Spokane Falls, Wash.....	18.9	16.8	30.8	36.0	41.5	48.1	46.5	46.7	41.5	36.9	31.1	20.9	34.6
<b>North Pacific Coast:</b>													
Olympia, Wash.....	33.0	29.3	37.4	41.4	44.7	48.4	49.0	51.4	48.8	44.2	40.2	33.9	41.8
Portland, Oreg.....	33.1	28.9	38.1	40.2	44.0	50.2	52.4	52.5	49.8	45.4	40.2	34.1	42.4
<b>Middle Pacific Coast:</b>													
Red Bluff, Cal.....	33.8	33.9	40.6	42.3	45.4	49.1	48.9	47.6	44.6	43.2	40.6	36.9	42.3
Sacramento, Cal.....	37.3	37.9	44.0	44.8	50.4	54.5	55.4	55.5	52.6	48.8	43.8	40.7	47.2
San Francisco, Cal.....	40.4	39.2	45.1	45.4	48.5	51.4	52.4	52.7	52.4	50.7	47.6	44.4	47.5
<b>South Pacific Coast:</b>													
Los Angeles, Cal.....	37.2	39.2	46.0	47.0	50.8	55.8	58.1	58.9	55.7	49.5	43.6	41.3	48.6
San Diego, Cal.....	39.5	41.8	47.9	48.4	52.2	56.0	59.7	61.7	58.2	51.3	46.0	43.9	50.6
<b>Alaska Stations:</b>													
Saint Michael's, Fort, Alaska.....	9.3	10.0	14.0	17.0	32.6	41.2	48.8	47.9	39.6	26.7	14.6	2.7	25.2
Sitka, Alaska.....	29.5	25.3	28.1	31.8	38.4	43.5	47.2	49.3	45.2	37.2	31.7	27.8	36.2

## APPENDIX 40.

*Dates of the first light frost at stations of the Signal Service, United States Army, east of the Rocky Mountains for the winter of 1884-'85.*

Stations.	Latitude.	Longitude.	Date.	Stations.	Latitude.	Longitude.	Date.
<b>New England:</b>	° /	° /		<b>Lower Lakes:</b>	° /	° /	
Eastport, Me. ....	44 54	66 50	Oct. 15	Buffalo, N. Y. ....	42 53	78 53	Sept. 19
Portland, Me. ....	43 59	70 15	Oct. 15	Oswego, N. Y. ....	43 29	76 35	Sept. 19
Mount Washing-				Rochester, N. Y. ....	43 8	77 42	Sept. 19
ton, N. H. ....	44 16	71 18	July 29	Erie, Pa. ....	42 7	80 5	Oct. 7
Boston, Mass. ....	42 21	71 4	Oct. 10	Cleveland, Ohio. ....	41 30	81 42	Oct. 15
Block Island, R. I. ....	41 10	71 38	Nov. 10	Sandusky, Ohio. ....	41 23	82 40	Oct. 10
New Haven, Conn. ....	41 18	72 56	Oct. 24	Toledo, Ohio. ....	41 40	83 34	Oct. 9
New London, Conn. ....	41 21	72 5	Oct. 10	Detroit, Mich. ....	42 20	83 8	Oct. 9
<b>Middle Atlantic States:</b>				<b>Upper Lakes:</b>			
Albany, N. Y. ....	42 39	73 45	Oct. 9	Alpena, Mich. ....	45 5	83 30	Aug. 9
New York City. ....	40 43	74 0	( <sup>1</sup> )	Escanaba, Mich. ....	45 48	87 5	Aug. 7
Philadelphia, Pa. ....	39 57	75 9	Nov. 10	Grand Haven, Mich. ....	43 5	86 18	Sept. 21
Atlantic City, N. J. ....	39 22	74 25	Oct. 26	Mackinaw City, ....			
Barnegat City, N. J. ....	39 46	74 6	Oct. 26	Mich. ....	45 47	84 39	Oct. 14
Cape May, N. J. ....	38 56	74 58	Oct. 10	Marquette, Mich. ....	46 34	87 24	Sept. 29
Sandy Hook, N. J. ....	40 28	74 0	Oct. 15	Port Huron, Mich. ....	43 0	82 26	Aug. 24
Delaware Break-				Chicago, Ill. ....	41 52	87 38	Nov. 6
water, Del. ....	38 48	75 10	Oct. 16	Milwaukee, Wis. ....	43 2	87 54	Nov. 2
Baltimore, Md. ....	39 18	76 37	Nov. 21	Duluth, Minn. ....	46 48	92 6	Nov. 3
Washington City. ....	38 54	77 2	Oct. 10	<b>Upper Mississippi Val-</b>			
Cape Henry, Va. ....	36 56	76 0	Jan. 11	ley:			
Chincoteague, Va. ....	37 55	75 23	( <sup>1</sup> )	Saint Paul, Minn. ....	44 58	93 3	Oct. 9
Lynchburg, Va. ....	37 25	79 9	Oct. 16	La Crosse, Wis. ....	43 49	91 15	Oct. 14
Norfolk, Va. ....	36 51	76 17	Oct. 25	Davenport, Iowa. ....	41 30	90 38	Oct. 9
<b>South Atlantic States:</b>				Des Moines, Iowa. ....	41 35	93 37	Oct. 9
Charlotte, N. C. ....	35 18	80 51	Oct. 16	Dubuque, Iowa. ....	42 30	90 44	Oct. 9
Hatteras, N. C. ....	35 15	75 40	Jan. 2	Keokuk, Iowa. ....	40 22	91 26	Oct. 9
Kitty Hawk, N. C. ....	36 0	75 42	Nov. 1	Cairo, Ill. ....	37 0	89 10	Nov. 5
Macon, Fort, N. C. ....	34 42	76 40	Dec. 10	Springfield, Ill. ....	39 48	89 39	Oct. 10
Smithville, N. C. ....	33 55	78 1	Jan. 22	Saint Louis, Mo. ....	38 38	90 12	Oct. 22
Wilmington, N. C. ....	34 14	77 57	Oct. 25	<b>Missouri Valley:</b>			
Charleston, S. C. ....	32 47	79 56	Oct. 25	Leavenworth, Kans. ....	39 19	94 57	Oct. 9
Augusta, Ga. ....	33 28	81 54	Oct. 16	Omaha, Nebr. ....	41 16	95 56	Oct. 22
Savannah, Ga. ....	32 5	81 5	Oct. 25	Bennett, Fort, Dak. ....	44 43	100 39	Sept. 27
Jacksonville, Fla. ....	30 20	81 39	Nov. 25	Huron, Dak. ....	44 21	98 9	Sept. 11
<b>Florida Peninsula:</b>				Yankton, Dak. ....	42 54	97 28	Oct. 8
Cedar Keys, Fla. ....	29 8	83 2	Dec. 20	<b>Extreme Northwest:</b>			
Key West, Fla. ....	24 24	81 49	( <sup>2</sup> )	Moorhead, Minn. ....	46 52	96 44	Sept. 20
Sanford, Fla. ....	28 48	81 23	Dec. 3	Saint Vincent, Minn. ....	48 56	97 14	Aug. 23
<b>Eastern Gulf States:</b>				Bismarck, Dak. ....	46 47	100 38	Sept. 9
Atlanta, Ga. ....	33 45	84 23	Oct. 24	Buford, Fort, Dak. ....	48 0	103 56	Sept. 9
Pensacola, Fla. ....	30 25	87 18	Nov. 21	Totten, Fort, Dak. ....	47 57	98 57	Sept. 20
Mobile, Ala. ....	30 41	88 2	Nov. 8	<b>Northern Slope:</b>			
Montgomery, Ala. ....	32 23	86 18	Oct. 17	Aassinaboine, Fort, ....			
Vicksburg, Miss. ....	32 22	90 53	Oct. 24	Mont. ....	46 32	109 42	Sept. 7
New Orleans, La. ....	29 58	90 4	Nov. 7	Benton, Fort, Mont. ....	47 50	110 40	Nov. 10
<b>Western Gulf States:</b>				Custer, Fort, Mont. ....	45 42	107 34	Oct. 7
Shreveport, La. ....	32 30	93 40	Nov. 6	Helena, Mont. ....	46 34	112 4	Sept. 6
Fort Smith, Ark. ....	35 23	94 24	Oct. 24	Maginnis, Fort, ....			
Little Rock, Ark. ....	34 45	92 6	Oct. 24	Mont. ....	47 12	109 10	Sept. 7
Galveston, Tex. ....	29 18	94 47	Nov. 8	Poplar River, Mont. ....	48 8	105 10	Sept. 4
Indianola, Tex. ....	28 32	96 31	Jan. 26	Shaw, Fort, Mont. ....	47 31	111 48	Oct. 7
Palestine, Tex. ....	31 45	95 40	Nov. 7	Deadwood, Dak. ....	44 23	103 43	Aug. 21
<b>Rio Grande Valley:</b>				Cheyenne, Wyo. ....	41 8	104 48	Sept. 10
Brownsville, Tex. ....	25 53	97 26	Jan. 18	North Platte, Nebr. ....	41 8	100 45	Oct. 8
Rio Grande City, ....				<b>Middle Slope:</b>			
Tex. ....	26 23	98 48	( <sup>3</sup> )	Denver, Colo. ....	39 45	105 0	Sept. 9
<b>Ohio Valley and Ten-</b>				Pike's Peak, Colo. ....	38 50	105 2	( <sup>3</sup> )
nessee:				West Las Animas, ....			
Chattanooga, Tenn. ....	35 4	85 15	Oct. 23	Colo. ....	38 4	103 12	Oct. 9
Knoxville, Tenn. ....	35 56	83 58	Oct. 23	Dodge City, Kans. ....	37 45	100 0	Oct. 8
Memphis, Tenn. ....	35 9	90 3	Oct. 23	Elliot, Fort, Tex. ....	35 30	100 21	Oct. 23
Nashville, Tenn. ....	36 10	86 47	Oct. 16	<b>Southern Slope:</b>			
Louisville, Ky. ....	38 15	85 45	Oct. 19	Sill, Fort, Ind. T. ....	34 40	98 23	Nov. 7
Greencastle, Ind. ....	39 40	86 53	Oct. 24	Concho, Fort, Tex. ....	31 25	100 34	Nov. 9
Indianapolis, Ind. ....	39 46	86 10	Oct. 15	Davis, Fort, Tex. ....	30 38	103 56	Nov. 8
Cincinnati, Ohio. ....	39 6	84 30	Nov. 8	Stockton, Fort, Tex. ....	30 53	102 53	Nov. 6
Columbus, Ohio. ....	39 58	83 0	Oct. 15	<b>Southern Plateau:</b>			
Pittsburg, Pa. ....	40 32	80 2	Oct. 10	El Paso, Tex. ....	31 47	106 30	Oct. 28

<sup>1</sup> None reported.<sup>2</sup> No frost observed.<sup>3</sup> Every month in the year.



## APPENDIX 41.

*Dates of the first killing frost at stations of the Signal Service, United States Army, east of the Rocky Mountains for each winter from 1873-'74 to 1884-'85.*

Stations.	Latitude.	Longitude.	WINTER OF—													
			1873-'74.	1874-'75.	1875-'76.	1876-'77.	1877-'78.	1878-'79.	1879-'80.	1880-'81.	1881-'82.	1882-'83.	1883-'84.	1884-'85.		
New England:	° ' "	° ' "														
Eastport, Me.	44 54	66 59	Nov. 4	Nov. 12	Oct. 3	Oct. 9	Oct. 26	Sept. 8	Sept. 26	Oct. 26	Oct. 20	Oct. 5	Oct. 2	Sept. 20		
Portland, Me.	43 39	70 15	Nov. 4	Nov. 3	Oct. 14	Oct. 2	Oct. 17	Oct. 29	Sept. 28	Oct. 27	Oct. 27	Oct. 28	Nov. 1	Oct. 10		
Mount Washington, N. H.	44 16	71 18	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	July 25		
Boston, Mass.	42 31	71 4	Oct. 9	Nov. 12	Oct. 13	Oct. 13	Oct. 28	Oct. 29	Sept. 28	Oct. 1	Oct. 5	Nov. 3	Oct. 8	Oct. 24		
Block Island, R. I.	41 10	71 38												Nov. 19		
New Haven, Conn.	41 18	72 56	Oct. 28	Oct. 5	Oct. 13	Oct. 12	Nov. 7	Nov. 27	Oct. 25	Oct. 25	Dec. 18	Dec. 19	Oct. 5	Oct. 10		
New London, Conn.	41 21	72 5	Nov. 4	Nov. 2	Oct. 13	Oct. 7	Oct. 6	Oct. 29	Oct. 25	Oct. 25	Oct. 5	Nov. 3	Oct. 5	Oct. 19		
Middle Atlantic States:																
Albany, N. Y.	42 39	73 45		Oct. 20	Oct. 13	Oct. 18	Oct. 23	Oct. 7	Sept. 28	Nov. 10	Nov. 21	Nov. 3	Oct. 16	Oct. 19		
New York City.	40 43	74 0	Nov. 7	Nov. 13	Nov. 2	Oct. 15	Oct. 22	Nov. 4	Oct. 25	Nov. 23	Nov. 10	Nov. 3	Oct. 15	Nov. 7		
Philadelphia, Pa.	39 57	75 9	Oct. 29	Nov. 3	Nov. 10	Oct. 12	Oct. 23	Nov. 4	Oct. 25	Nov. 16	Oct. 6	Nov. 6	Nov. 18	Nov. 23		
Atlantic City, N. J.	39 22	74 25		Oct. 15	Nov. 3	Oct. 15	Nov. 7	Oct. 29	Oct. 25	Oct. 25	Nov. 16	Nov. 16	Nov. 8	Nov. 21		
Barnegat City, N. J.	39 46	74 6		Nov. 13	Nov. 1	Oct. 15	Nov. 7	Nov. 9	Oct. 25	Nov. 16	Nov. 27	Nov. 21	Nov. 13	Nov. 21		
Cape May, N. J.	38 56	74 68	Oct. 30	Nov. 3	Nov. 8	Nov. 8	Nov. 20	Oct. 29	Nov. 4	Dec. 2	Nov. 16	Nov. 21	Nov. 8	Oct. 24		
Sandy Hook, N. J.	40 28	74 0		Nov. 16	Nov. 8	Nov. 8	Nov. 30	Nov. 4		Nov. 18	Nov. 21	Nov. 23	Nov. 15	Nov. 24		
Delaware Breakwater, Del.	38 48	75 10								Nov. 19	Nov. 25	Nov. 26	Nov. 15	Nov. 7		
Baltimore, Md.	39 18	76 37	Oct. 29	Nov. 10	Nov. 3	Oct. 15	Nov. 4	Dec. 6	Oct. 26	Nov. 8	Nov. 27	Nov. 19	Nov. 15	Nov. 19		
Washington City.	38 54	77 3	Oct. 30	Oct. 15	Oct. 13	Oct. 12	Oct. 23	Dec. 6	Oct. 31	Nov. 5	Nov. 5	Nov. 5	Nov. 15	Oct. 19		
Cape Henry, Va.	36 56	76 0	Nov. 30	Nov. 30	Nov. 30	Nov. 27	Nov. 30		Nov. 30	Nov. 25	Nov. 25	Nov. 30	Dec. 15	Dec. 21		
Chincoteague, Va.	37 55	75 23							Dec. 11	Nov. 25	Nov. 25	Nov. 15	Nov. 15	Oct. 24		
Lynchburg, Va.	37 25	79 9	Oct. 20	Oct. 14	Nov. 6	Oct. 3	Nov. 28	Nov. 4	Oct. 25	Nov. 16	Nov. 16	Nov. 15	Nov. 15	Oct. 24		
Norfolk, Va.	36 51	76 17	Nov. 14	Nov. 30	Nov. 18	Oct. 15	Nov. 30	Oct. 21	Nov. 3	Nov. 16	Nov. 17	Nov. 15	Nov. 30	Nov. 21		
South Atlantic States:																
Charlotte, N. C.	35 13	80 51						Nov. 1	Oct. 26	Oct. 18	Nov. 4	Nov. 19	Nov. 2	Oct. 24		
Hatteras, N. C.	35 15	75 40												Dec. 4		
Kitty Hawk, N. C.	36 0	75 42												Dec. 18		
Macon, Fort, N. C.	34 42	76 40												Dec. 18		
Smithville, N. C.	33 55	78 1												Dec. 23		
Wilmington, N. C.	34 14	77 57												Dec. 23		
Charleston, S. C.	32 47	79 56	Nov. 21	Dec. 1	Nov. 12	Dec. 1	Dec. 1	Nov. 11	Nov. 4	Oct. 25	Nov. 25	Nov. 23	Dec. 23	Jan. 24		
Augusta, Ga.	32 28	81 54	Nov. 11	Dec. 8	Dec. 11	Dec. 20	Nov. 30	Nov. 11	Nov. 21	Nov. 16	Nov. 24	Dec. 6	Nov. 17	Dec. 25		
Savannah, Ga.	32 5	81 5	Oct. 8	Nov. 2	Dec. 10	Nov. 11	Nov. 28	Nov. 26	Nov. 5	Nov. 16	Nov. 26	Dec. 22	Dec. 17	Dec. 25		
Jacksonville, Fla.	30 20	81 39	Nov. 23	Feb. 5	Dec. 15	Dec. 1	Nov. 30	Dec. 3	Nov. 23	Nov. 16	Nov. 25	Nov. 22	Dec. 16	Dec. 3		
Florida Peninsula:																
Cedar Keys, Fla.	29 8	83 2		( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Dec. 23	( <sup>1</sup> )	Dec. 17	( <sup>1</sup> )	Nov. 25		
Key West, Fla.	24 24	81 40		( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )		
Sanford, Fla.	28 48	81 23											Jan. 10	( <sup>1</sup> )		

1 No record.

2 None observed.

<sup>1</sup> None observed.

<sup>2</sup> No record.

*Dates of the first killing frost at stations of the Signal Service, United States Army, east of the Rocky Mountains, &c.—Continued.*

Stations.	Latitude.	Longitude.	WINTER OF—											
			1873-74.	1874-75.	1875-76.	1876-77.	1877-78.	1878-79.	1879-80.	1880-81.	1881-82.	1882-83.	1883-84.	1884-85.
Eastern Gulf States:														
Atlanta, Ga.	33 45	84 23						Oct. 19	Nov. 4	Nov. 15	Nov. 4	Nov. 22	Nov. 13	Nov. 6
Pensacola, Fla.	30 25	87 13	Nov. 20	Nov. 2	Dec. 18	Nov. 9	Nov. 12	Nov. 2	Dec. 20	Nov. 16	Nov. 25	Nov. 29	Dec. 13	Nov. 19
Mobile, Ala.	30 41	88 18	Oct. 29	Dec. 15	Dec. 9	Nov. 10	Nov. 4	Nov. 1	Nov. 22	Dec. 6	Nov. 23	Nov. 13	Dec. 16	Dec. 25
Montgomery, Ala.	32 23	86 18	Oct. 20	Nov. 1	Dec. 18	Nov. 20	Nov. 7	Nov. 1	Nov. 19	Nov. 7	Nov. 4	Nov. 14	Nov. 3	Nov. 7
Vicksburg, Miss.	32 23	90 53	Nov. 20	Dec. 21	Dec. 9	Nov. 21	Nov. 11	Dec. 16	Dec. 20	Nov. 19	Nov. 23	Dec. 8	Nov. 16	Nov. 6
New Orleans, La.	29 58	90 4	Nov. 20	Dec. 21	Dec. 9	Nov. 21	Nov. 11	Dec. 16	Dec. 20	Nov. 19	Nov. 23	Dec. 8	Nov. 16	Nov. 6
Western Gulf States:														
Sturtevant, La.	22 30	93 40	Oct. 29	Nov. 1	Nov. 11	Dec. 3	Nov. 7	Oct. 23	Nov. 21	Dec. 7	Nov. 20	Nov. 14	Nov. 15	Nov. 7
Fort Smith, Ark.	35 22	94 24												Nov. 28
Little Rock, Ark.	34 45	92 6												Nov. 7
Galveston, Tex.	29 18	94 47												Nov. 18
Indianola, Tex.	28 32	96 31												Nov. 18
Palestine, Tex.	31 45	95 40												Nov. 18
Rio Grande Valley:														
Brownsville, Tex.	25 53	97 26												Nov. 20
Rio Grande City, Tex.	26 23	96 48												Nov. 20
Ohio Valley and Tennessee:														
Chattanooga, Tenn.	35 4	85 15												Nov. 20
Knoxville, Tenn.	35 56	83 58												Nov. 20
Memphis, Tenn.	35 9	90 3												Nov. 20
Nashville, Tenn.	36 10	86 47												Nov. 20
Louisville, Ky.	38 15	85 45												Nov. 20
Greencastle, Ind.	39 40	86 53												Nov. 20
Indianapolis, Ind.	39 46	86 10												Nov. 20
Cincinnati, Ohio	39 6	84 80												Nov. 20
Columbus, Ohio	39 58	83 0												Nov. 20
Pittsburg, Pa.	40 52	80 2												Nov. 20
Lower Lakes:														
Buffalo, N. Y.	42 53	78 53												Nov. 20
Oswego, N. Y.	43 29	76 35												Nov. 20
Rochester, N. Y.	43 8	77 42												Nov. 20
Erle, Pa.	42 7	80 5												Nov. 20
Cleveland, Ohio	41 30	81 42												Nov. 20
Sandusky, Ohio	41 25	82 40												Nov. 20
Toledo, Ohio	41 40	83 84												Nov. 20
Detroit, Mich.	42 20	83 3												Nov. 20
Upper Lakes:														
Alpena, Mich.	45 5	83 30												Nov. 20
Escanaba, Mich.	45 48	87 5												Nov. 20
Grand Haven, Mich.	43 5	86 18												Nov. 20
Mackinaw City, Mich.	45 47	84 39												Nov. 20
Marquette, Mich.	46 34	87 24												Nov. 20

Port Huron, Mich.	43 0	82 26	Oct. 23	Oct. 12	Oct. 10	Oct. 4	Oct. 5	Nov. 14	Sept. 23	Oct. 28	Oct. 11	Oct. 18	Sept. 28	Oct. 24
Chicago, Ill.	41 52	87 38	Oct. 23	Oct. 12	Oct. 4	Oct. 22	Oct. 22	Oct. 19	Oct. 23	Oct. 18	Oct. 19	Oct. 18	Sept. 28	Oct. 24
Milwaukee, Wis.	43 2	87 64	Oct. 7	Oct. 13	Sept. 17	Sept. 30	Sept. 18	Nov. 3	Oct. 24	Oct. 13	Oct. 19	Oct. 19	Oct. 1	Oct. 9
Duluth, Minn.	46 46	92 8	Oct. 6	Oct. 12	Sept. 8	Sept. 20	Sept. 30	Sept. 21	Sept. 21	Oct. 10	Oct. 10	Sept. 23	Oct. 21	Oct. 8
Upper Mississippi Valley:														
Saint Paul, Minn.	44 63	98 3	Sept. 1	Oct. 12	Oct. 11	Sept. 29	Oct. 19	Oct. 18	Oct. 22	Oct. 12	Oct. 5	Oct. 18	Sept. 30	Oct. 22
La Crosse, Wis.	43 40	91 15	Oct. 22	Oct. 13	Oct. 10	Oct. 5	Oct. 5	Oct. 19	Sept. 24	Oct. 12	Oct. 5	Oct. 19	Oct. 1	Oct. 22
Davenport, Iowa.	41 30	90 38	Oct. 22	Oct. 13	Oct. 10	Oct. 5	Oct. 11	Oct. 27	Oct. 20	Oct. 8	Oct. 5	Oct. 19	Oct. 3	Oct. 22
Des Moines, Iowa.	41 35	93 37	Oct. 22	Oct. 13	Oct. 10	Oct. 5	Oct. 11	Oct. 27	Oct. 20	Oct. 8	Oct. 5	Oct. 19	Oct. 3	Oct. 22
Dubuque, Iowa.	42 50	90 44	Oct. 20	Oct. 13	Oct. 18	Oct. 7	Oct. 30	Sept. 12	Oct. 19	Sept. 27	Oct. 2	Oct. 13	Sept. 15	Oct. 23
Keokuk, Iowa.	40 23	91 26	Oct. 6	Oct. 13	Oct. 18	Oct. 7	Oct. 5	Sept. 12	Oct. 23	Oct. 27	Oct. 2	Oct. 13	Sept. 15	Oct. 23
Keokuk, Iowa.	37 0	89 10	Oct. 21	Oct. 13	Oct. 2	Oct. 15	Nov. 3	Oct. 19	Nov. 2	Nov. 4	Oct. 19	Oct. 18	Oct. 12	Oct. 24
Chicago, Ill.	39 48	89 39	Oct. 23	Oct. 31	Oct. 31	Oct. 10	Nov. 3	Oct. 18	Nov. 20	Nov. 1	Oct. 20	Nov. 13	Oct. 10	Oct. 21
Springfield, Ill.	38 38	90 12	Oct. 23	Oct. 31	Oct. 31	Oct. 10	Nov. 3	Oct. 18	Nov. 20	Nov. 1	Oct. 20	Nov. 13	Oct. 10	Oct. 23
Saint Louis, Mo.	39 19	91 57	Oct. 6	Oct. 13	Oct. 10	Oct. 11	Oct. 4	Sept. 13	Oct. 18	Oct. 17	Nov. 8	Nov. 12	Oct. 20	Oct. 22
Missouri Valley:														
Leavenworth, Kans.	41 16	85 56	Sept. 29	Oct. 13	Oct. 10	Oct. 11	Oct. 4	Sept. 28	Oct. 18	Oct. 18	Oct. 13	Nov. 12	Oct. 20	Nov. 4
Omaha, Nebr.	41 43	100 39	Sept. 29	Oct. 13	Oct. 10	Oct. 11	Oct. 4	Sept. 28	Oct. 18	Oct. 18	Oct. 13	Nov. 12	Oct. 20	Nov. 4
Bismarck, Dak.	44 21	98 9	Sept. 13	Sept. 15	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20
Huron, Dak.	44 21	98 9	Sept. 13	Sept. 15	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20
Yankton, Dak.	42 54	97 28	Sept. 13	Sept. 15	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20
Extreme Northwest:														
Moorhead, Minn.	46 52	96 44	Sept. 13	Sept. 15	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20
Saint Vincent, Minn.	48 50	97 14	Sept. 13	Sept. 15	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20
Bismarck, Dak.	46 47	100 38	Sept. 13	Sept. 15	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20
Butford, Fort, Dak.	48 0	103 56	Sept. 13	Sept. 15	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20
Totten, Fort, Dak.	47 57	98 57	Sept. 13	Sept. 15	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20	Sept. 20
Northern Slope:														
Asinaboune, Fort, Mont.	48 23	109 43	Sept. 24	Sept. 20	Oct. 11	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Sept. 10	Sept. 13	Sept. 15	Sept. 23	Sept. 8	Oct. 8
Benton, Fort, Mont.	47 50	110 40	Sept. 24	Sept. 20	Oct. 11	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Sept. 10	Sept. 13	Sept. 15	Sept. 23	Sept. 8	Oct. 8
Castor, Fort, Mont.	43 42	107 81	Sept. 24	Sept. 20	Oct. 11	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Sept. 10	Sept. 13	Sept. 15	Sept. 23	Sept. 8	Oct. 8
Ilelena, Mont.	46 31	112 4	Sept. 24	Sept. 20	Oct. 11	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Sept. 10	Sept. 13	Sept. 15	Sept. 23	Sept. 8	Oct. 8
Maginnis, Fort, Mont.	47 12	109 10	Sept. 24	Sept. 20	Oct. 11	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Sept. 10	Sept. 13	Sept. 15	Sept. 23	Sept. 8	Oct. 8
Poplar River, Mont.	48 8	105 10	Sept. 24	Sept. 20	Oct. 11	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Sept. 10	Sept. 13	Sept. 15	Sept. 23	Sept. 8	Oct. 8
Shaw, Fort, Mont.	47 31	111 48	Sept. 24	Sept. 20	Oct. 11	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Sept. 10	Sept. 13	Sept. 15	Sept. 23	Sept. 8	Oct. 8
Deadwood, Dak.	44 23	107 43	Sept. 18	Sept. 3	Sept. 20	Sept. 17	Sept. 17	Sept. 11	Oct. 26	Sept. 12	Sept. 15	Sept. 15	Sept. 21	Sept. 30
Cheyenne, Wyo.	41 8	104 48	Sept. 18	Sept. 3	Sept. 20	Sept. 17	Sept. 17	Sept. 11	Oct. 26	Sept. 12	Sept. 15	Sept. 15	Sept. 21	Sept. 30
North Platte, Nebr.	41 8	100 45	Sept. 18	Sept. 3	Sept. 20	Sept. 17	Sept. 17	Sept. 11	Oct. 26	Sept. 12	Sept. 15	Sept. 15	Sept. 21	Sept. 30
Middle Slope:														
Denver, Colo.	39 45	105 0	Sept. 29	Oct. 29	Sept. 23	Sept. 30	Oct. 4	Oct. 31	Oct. 10	Oct. 18	Sept. 10	Oct. 8	Sept. 21	Oct. 9
Pike's Peak, Colo.	38 50	105 2	Sept. 29	Oct. 29	Sept. 23	Sept. 30	Oct. 4	Oct. 31	Oct. 10	Oct. 18	Sept. 10	Oct. 8	Sept. 21	Oct. 9
West Las Animas, Colo.	38 4	103 12	Sept. 29	Oct. 29	Sept. 23	Sept. 30	Oct. 4	Oct. 31	Oct. 10	Oct. 18	Sept. 10	Oct. 8	Sept. 21	Oct. 9
Dodge City, Kans.	37 45	100 0	Sept. 29	Oct. 29	Sept. 23	Sept. 30	Oct. 4	Oct. 31	Oct. 10	Oct. 18	Sept. 10	Oct. 8	Sept. 21	Oct. 9
Elliot, Fort, Tex.	35 30	100 21	Sept. 29	Oct. 29	Sept. 23	Sept. 30	Oct. 4	Oct. 31	Oct. 10	Oct. 18	Sept. 10	Oct. 8	Sept. 21	Oct. 9
Southern Slope:														
Sil, Fort, Ind. T.	34 40	98 23	Sept. 29	Oct. 29	Sept. 23	Sept. 30	Oct. 4	Oct. 31	Oct. 10	Oct. 18	Sept. 10	Oct. 8	Sept. 21	Oct. 9
Concho, Fort, Tex.	31 25	100 34	Sept. 29	Oct. 29	Sept. 23	Sept. 30	Oct. 4	Oct. 31	Oct. 10	Oct. 18	Sept. 10	Oct. 8	Sept. 21	Oct. 9
Davis, Fort, Tex.	30 38	103 56	Sept. 29	Oct. 29	Sept. 23	Sept. 30	Oct. 4	Oct. 31	Oct. 10	Oct. 18	Sept. 10	Oct. 8	Sept. 21	Oct. 9
Stockton, Fort, Tex.	30 53	102 53	Sept. 29	Oct. 29	Sept. 23	Sept. 30	Oct. 4	Oct. 31	Oct. 10	Oct. 18	Sept. 10	Oct. 8	Sept. 21	Oct. 9
Southern Plateau:														
El Paso, Tex.	31 47	106 30	Sept. 29	Oct. 29	Sept. 23	Sept. 30	Oct. 4	Oct. 31	Oct. 10	Oct. 18	Sept. 10	Oct. 8	Sept. 21	Oct. 9

\* Every month in the year.

\* No record.

\* None observed.

## APPENDIX 42.

*Dates of the last light frost at stations of the Signal Service, United States Army, east of the Rocky Mountains for the winter of 1884-'85.*

Stations.	Latitude.	Longitude.	Date.	Stations.	Latitude.	Longitude.	Date.
	° ' "	° ' "	1884-'85.		° ' "	° ' "	1884-'85.
<b>New England:</b>				<b>Lower Lakes—Cont'd:</b>			
Eastport, Me. ....	44 54	66 59	Apr. 16	Oswego, N. Y. ....	43 29	76 35	June 3
Portland, Me. ....	43 39	70 15	( <sup>1</sup> )	Rochester, N. Y. ....	43 8	77 42	May 28
Mount Washing-				Erie, Pa. ....	42 7	80 5	( <sup>1</sup> )
ton, N. H. ....	44 16	71 18	( <sup>2</sup> )	Cleveland, Ohio ....	41 30	81 42	May 2
Boston, Mass. ....	42 21	71 4	Feb. 28	Sandusky, Ohio ....	41 25	82 40	Apr. 29
Block Island, R. I. ....	41 10	71 36	Mar. 9	Toledo, Ohio ....	41 40	83 34	May 10
New Haven, Conn. ....	41 18	72 56	May 12	Detroit, Mich. ....	42 20	83 3	Apr. 29
New London, Conn. ....	41 21	72 5	June 10	<b>Upper Lakes:</b>			
<b>Middle Atlantic States:</b>				Alpena, Mich. ....	45 5	83 30	May 13
Albany, N. Y. ....	42 39	73 45	May 4	Escanaba, Mich. ....	45 48	87 5	June 29
New York City ....	40 43	74 0	( <sup>1</sup> )	Grand Haven, Mich. ....	43 5	86 18	June 29
Philadelphia, Pa. ....	39 57	75 9	Apr. 20	Mackinaw City, Mich. ....	45 47	84 39	May 12
Atlantic City, N. J. ....	39 22	74 25	Apr. 9	Marquette, Mich. ....	46 34	87 24	June 8
Barnegat City, N. J. ....	39 46	74 6	( <sup>2</sup> )	Port Huron, Mich. ....	43 0	82 26	June 23
Cape May, N. J. ....	38 56	74 58	Apr. 14	Chicago, Ill. ....	41 52	87 38	May 11
Sandy Hook, N. J. ....	40 28	74 0	May 12	Milwaukee, Wis. ....	43 2	87 54	Apr. 29
Baltimore, Md. ....	39 18	76 37	Apr. 9	Duluth, Minn. ....	46 48	92 6	May 11
Washington City ....	38 54	77 2	Apr. 20	<b>Upper Mississippi Valley:</b>			
Cape Henry, Va. ....	36 56	76 0	Mar. 30	Saint Paul, Minn. ....	44 58	93 3	May 10
Chincoteague, Va. ....	37 55	75 23	May 12	La Crosse, Wis. ....	43 49	91 15	June 23
Lynchburg, Va. ....	37 25	79 9	May 11	Davenport, Iowa ....	41 30	90 38	May 10
Norfolk, Va. ....	36 51	76 17	Apr. 14	Des Moines, Iowa ....	41 35	93 37	June 9
<b>South Atlantic States:</b>				Dubuque, Iowa ....	42 30	90 44	June 9
Charlotte, N. C. ....	35 13	80 51	Apr. 9	Keokuk, Iowa ....	40 22	91 26	May 10
Hatteras, N. C. ....	35 15	75 40	Mar. 24	Cairo, Ill. ....	37 0	89 10	May 10
Kitty Hawk, N. C. ....	36 0	75 42	Jan. 30	Springfield, Ill. ....	39 48	89 39	May 10
Macon, Fort, N. C. ....	34 42	76 40	Apr. 14	Saint Louis, Mo. ....	38 38	90 12	May 8
Smithville, N. C. ....	33 55	78 1	Mar. 23	<b>Missouri Valley:</b>			
Wilmington, N. C. ....	34 14	77 57	Mar. 22	Lamar, Mo. ....	37 32	94 15	May 10
Charleston, S. C. ....	32 47	79 56	Mar. 24	Leavenworth, Kans. ....	39 19	94 57	May 10
Augusta, Ga. ....	33 28	81 54	Mar. 17	Omaha, Nebr. ....	41 16	95 56	May 10
Savannah, Ga. ....	32 5	81 5	Mar. 10	Bennett, Fort, Dak. ....	44 43	100 39	Apr. 26
Jacksonville, Fla. ....	30 20	81 39	Mar. 19	Huron, Dak. ....	44 21	98 9	Apr. 28
<b>Florida Peninsula:</b>				Yankton, Dak. ....	42 54	97 28	June 22
Cedar Keys, Fla. ....	29 8	83 2	Feb. 21	<b>Extreme Northwest:</b>			
Key West, Fla. ....	24 34	81 49	( <sup>1</sup> )	Moorhead, Minn. ....	46 52	96 44	June 22
Sanford, Fla. ....	28 48	81 23	Mar. 10	Saint Vincent, Minn. ....	46 56	97 14	June 22
<b>Eastern Gulf States:</b>				Bismarck, Dak. ....	46 47	100 38	June 23
Atlanta, Ga. ....	33 45	84 23	Apr. 14	Buford, Fort, Dak. ....	48 0	103 58	June 8
Pensacola, Fla. ....	30 25	87 13	Apr. 5	Totten, Fort, Dak. ....	47 57	98 57	May 16
Mobile, Ala. ....	30 41	88 2	Mar. 10	<b>Northern Slope:</b>			
Montgomery, Ala. ....	32 23	88 18	Mar. 16	Assinaboine, Fort, Mont. ....	48 32	109 42	May 10
Vicksburg, Miss. ....	32 22	90 53	Mar. 29	Benton, Fort, Mont. ....	47 50	110 40	Apr. 28
New Orleans, La. ....	29 58	90 4	Mar. 10	Custer, Fort, Mont. ....	45 42	107 34	( <sup>1</sup> )
<b>Western Gulf States:</b>				Holens, Mont. ....	46 34	112 4	June 8
Shreveport, La. ....	32 30	93 40	Mar. 29	Maginnis, Fort, Mont. ....	47 12	109 10	June 15
Fort Smith, Ark. ....	35 22	94 24	Apr. 13	Poplar River, Mont. ....	48 8	105 10	May 24
Little Rock, Ark. ....	34 45	92 6	Mar. 16	Shaw, Fort, Mont. ....	47 31	111 48	June 8
Galveston, Tex. ....	29 18	94 47	Feb. 12	Deadwood, Dak. ....	44 23	103 48	June 15
Indianola, Tex. ....	28 32	96 31	Feb. 16	Cheyenne, Wyo. ....	41 8	104 48	June 15
Palestine, Tex. ....	31 45	95 40	Mar. 29	North Platte, Nebr. ....	41 8	100 45	June 15
<b>Rio Grande Valley:</b>				<b>Middle Slope:</b>			
Brownsville, Tex. ....	25 53	97 26	Jan. 18	Denver, Colo. ....	39 45	105 0	Apr. 30
Rio Grande City, Tex. ....	26 23	98 48	Jan. 26	Pike's Peak, Colo. ....	38 50	105 2	( <sup>1</sup> )
<b>Ohio Valley and Tennessee:</b>				West Las Animas, Colo. ....	38 4	103 12	Apr. 15
Chattanooga, Tenn. ....	35 4	85 15	May 11	Dodge City, Kans. ....	37 45	100 0	May 12
Knoxville, Tenn. ....	35 56	83 58	May 11	Elliott, Fort, Tex. ....	35 30	100 21	Mar. 22
Memphis, Tenn. ....	35 9	90 8	May 10	<b>Southern Slope:</b>			
Nashville, Tenn. ....	36 10	86 47	May 10	Sill, Fort, Ind. T. ....	34 40	98 28	Mar. 9
Louisville, Ky. ....	38 15	85 45	Apr. 13	Concho, Fort, Tex. ....	31 25	100 34	Mar. 2
Greencastle, Ind. ....	39 40	86 53	May 8	Davis, Fort, Tex. ....	30 38	103 56	Apr. 28
Indianapolis, Ind. ....	39 46	86 10	May 10	Stockton, Fort, Tex. ....	30 53	102 53	Feb. 12
Cincinnati, Ohio ....	39 6	84 30	Apr. 29	<b>Southern Plateau:</b>			
Columbus, Ohio ....	39 58	83 0	May 8	El Paso, Tex. ....	31 47	106 30	Apr. 28
Pittsburg, Pa. ....	40 32	80 2	May 8				
<b>Lower Lakes:</b>							
Buffalo, N. Y. ....	42 53	78 53	May 3				

<sup>1</sup>No reliable record.<sup>2</sup>Frost every month in the year.<sup>3</sup>No frost observed.

## APPENDIX 43.

Dates of the last killing frost at stations of the Signal Service, United States Army, east of the Rocky Mountains for each winter from 1873-74 to 1884-85.

Stations.	Latitude.	Longitude.	WINTER OF—												1884-85.
			1873-74.	1874-75.	1875-76.	1876-77.	1877-78.	1878-79.	1879-80.	1880-81.	1881-82.	1882-83.	1883-84.		
New England:															
Beeport, Me.	44 54	66 59	May 2	June 19	Apr. 30	Apr. 3	Apr. 10	Apr. 21	May 1	May 4	Apr. 14	Apr. 80	Apr. 23	May 4	
Portland, Me.	43 39	70 15	Apr. 30	Apr. 22	Apr. 9	Apr. 4	Mar. 26	Apr. 20	Apr. 13	Apr. 15	Apr. 12	Apr. 24	Apr. 22	Apr. 11	
Mount Washington, N. H.	44 16	71 18	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Boston, Mass.	42 21	71 4	May 3	Apr. 22	Apr. 9	Apr. 19	Mar. 26	Apr. 19	Apr. 13	Apr. 22	May 3	Apr. 20	Apr. 22	May 15	
Block Island, R. I.	41 10	71 36	Apr. 30	Apr. 22	May 1	Apr. 13	Mar. 26	May 24	Mar. 3	Apr. 23	May 16	Apr. 30	Apr. 30	May 4	
New Haven, Conn.	41 18	72 56	Apr. 18	Apr. 8	May 1	May 5	Mar. 10	May 24	Apr. 12	Apr. 7	May 3	Apr. 29	Apr. 6	Apr. 18	
New London, Conn.	41 31	72 5													
Middle Atlantic States:															
Albany, N. Y.	42 39	73 45	May 7	May 1	May 1	May 3	May 14	Apr. 20	Apr. 13	Apr. 7	Apr. 12	Apr. 8	Apr. 1	Apr. 10	
New York City	40 43	74 0	May 20	Apr. 25	Apr. 10	Apr. 3	Mar. 26	Apr. 6	Apr. 12	Apr. 4	Apr. 12	Apr. 2	Mar. 31	Apr. 15	
Philadelphia, Pa.	39 57	75 9	Apr. 29	Apr. 23	Apr. 10	Apr. 3	Mar. 26	Apr. 6	Apr. 12	Apr. 7	Apr. 12	Apr. 1	Mar. 31	Apr. 14	
Atlantic City, N. J.	39 22	74 25	Apr. 29	Apr. 23	Apr. 20	Apr. 11	Mar. 25	Apr. 20	Apr. 12	Apr. 7	Feb. 27	Mar. 31	Apr. 7	Mar. 23	
Barnegat City, N. J.	39 46	74 6	Apr. 13	Apr. 23	Apr. 9	Apr. 8	May 14	Apr. 13	Apr. 12	Mar. 16	Jan. 15	Apr. 30	Mar. 31	Apr. 14	
Cape May, N. J.	38 56	74 58	Apr. 13	Apr. 21	Apr. 9	Apr. 3	Mar. 26	Apr. 6	Apr. 12	Mar. 16	May 3	Mar. 9	Apr. 3	Apr. 14	
Sandy Hook, N. J.	40 28	74 0	Apr. 30	Apr. 22	Apr. 9	Mar. 29	Mar. 25	Apr. 6	Apr. 11	Apr. 7	Feb. 27	Apr. 2	Mar. 31	Mar. 30	
Delaware Breakwater, Del.	38 48	75 10													
Baltimore, Md.	39 18	76 37	Apr. 13	Apr. 22	Apr. 2	Apr. 3	Mar. 26	Apr. 25	Apr. 12	Apr. 21	Apr. 6	Apr. 12	Mar. 31	Mar. 16	
Washington City	38 54	77 3	Apr. 29	Apr. 18	Apr. 26	Mar. 31	Mar. 26	Apr. 25	Apr. 12	Apr. 7	Apr. 12	Mar. 1	Mar. 31	Mar. 14	
Cape Henry, Va.	36 56	76 0	Mar. 25	Apr. 19	Mar. 22	Mar. 20	Mar. 23	Mar. 6	Mar. 18	Apr. 29	Feb. 5	Mar. 25	Mar. 5	Feb. 24	
Chincoteague, Va.	37 55	75 23									Feb. 12	Apr. 12	Mar. 31	Apr. 11	
Lynchburg, Va.	37 25	76 9	Apr. 13	Apr. 19	Apr. 19	Apr. 15	Mar. 20	Mar. 6	Apr. 12	Apr. 7	May 3	Apr. 2	Mar. 10	Mar. 30	
Norfolk, Va.	36 51	76 17	Apr. 13	Apr. 19	Mar. 23	Mar. 20	Mar. 21	Apr. 6	Apr. 12	Apr. 7	Feb. 26	Mar. 23	Mar. 5	Apr. 11	
South Atlantic States:															
Charleston, S. C.	35 13	80 51						May 3	Apr. 13	Apr. 15	Mar. 25	Mar. 23	Mar. 10	Apr. 14	
Hatteras, N. C.	35 15	75 40								Apr. 5	Jan. 4	Mar. 23	Mar. 5	Feb. 21	
Kitty Hawk, N. C.	35 0	75 42								Apr. 7	Feb. 26	Mar. 23	Mar. 4	Feb. 28	
Macon, Fort N. C.	34 42	78 40								Apr. 6	Feb. 25	Mar. 23	Mar. 4	Mar. 24	
Smithville, N. C.	33 55	78 1								Apr. 6	Feb. 23	Mar. 23	Mar. 4	Mar. 24	
Wilmington, S. C.	34 14	77 57	Mar. 14	Apr. 19	Mar. 23	Mar. 11	Feb. 12	Mar. 19	Feb. 20	Apr. 2	Jan. 23	Jan. 12	Feb. 29	Mar. 24	
Charleston, S. C.	32 47	79 56	Jan. 17	Feb. 8	Mar. 22	Mar. 11	Feb. 12	Apr. 3	Mar. 30	Apr. 2	Jan. 6	Jan. 12	Feb. 11	Apr. 14	
Augusta, Ga.	32 26	81 56	Feb. 11	Feb. 21	Mar. 22	Mar. 10	Feb. 12	Mar. 10	Apr. 12	Apr. 2	Feb. 6	Jan. 23	Feb. 20	Apr. 13	
Savannah, Ga.	32 5	81 5	Feb. 5	Feb. 11	Mar. 22	Mar. 10	Feb. 12	Feb. 10	Apr. 12	Apr. 26	Jan. 6	Jan. 23	Feb. 20	Apr. 13	
Jacksonville, Fla.	30 26	81 39								Feb. 4	Feb. 6	Mar. 23	Jan. 22	Mar. 17	
Florida Peninsula:															
Cedar Keys, Fla.	29 8	83 2								Dec. 22	Jan. 3	Jan. 13	Jan. 22	Feb. 11	

\* Station closed April 1, 1885.

\* No killing frost reported.

\* Frost every month in the year.

*Dates of the last killing frost at stations of the Signal Service, United States Army, &c.—Continued.*

Stations.	Latitude.		Longitude.		WINTER OF—												1884-'85.
	°	'	°	'	1873-'74.	1874-'75.	1875-'76.	1876-'77.	1877-'78.	1878-'79.	1879-'80.	1880-'81.	1881-'82.	1882-'83.	1883-'84.		
Florida Peninsula—Continued:																	
Key West, Fla.	24	24	81	49	( <sup>1</sup> )										( <sup>1</sup> )		
Sanford, Fla.	28	45	81	23													
Eastern Gulf States:																	
Atlanta, Ga.	33	45	84	23													
Pensacola, Fla.	30	25	87	13													
Mobile, Ala.	30	41	88	2	Jan. 16	Feb. 8	Mar. 22	Jan. 25	Feb. 6	Mar. 18	Feb. 15	Apr. 23	Feb. 5	Apr. 20	Mar. 10	Mar. 24	
Montgomery, Ala.	32	23	86	18	Feb. 11	Feb. 9	Mar. 22	Mar. 7	Feb. 16	Jan. 18	Dec. 27	Apr. 5	Feb. 5	Jan. 23	Feb. 29	Mar. 23	
Vicksburg, Miss.	32	22	90	53	Jan. 16	Feb. 10	Mar. 22	Mar. 4	Feb. 12	Jan. 19	Feb. 10	Apr. 2	Mar. 13	Mar. 13	Mar. 1	Mar. 11	
New Orleans, La.	29	58	90	4	Jan. 16	Jan. 10	Mar. 22	Jan. 4	Feb. 12	Jan. 10	Dec. 26	Apr. 12	Nov. 28	Jan. 19	Feb. 26	Jan. 9	
Western Gulf States:																	
Shreveport, La.	32	30	93	40	Feb. 24	Mar. 7	Mar. 21	Mar. 10	Feb. 4	Jan. 20	Feb. 4	Feb. 2	Feb. 23	Feb. 19	Feb. 29	Mar. 23	
Fort Smith, Ark.	35	22	94	24											Mar. 9	Mar. 20	
Little Rock, Ark.	34	45	92	6							Mar. 17	Apr. 14	Feb. 22	Mar. 27	Mar. 9	Mar. 29	
Galveston, Tex.	29	18	94	47		Jan. 11		Jan. 1	Feb. 11	Jan. 9	Dec. 26	Feb. 22	Feb. 18	Feb. 18	Feb. 15	Feb. 11	
Indianola, Tex.	28	32	96	31		Apr. 1	( <sup>1</sup> )	Jan. 10	Nov. 30	Jan. 8	Mar. 15	Apr. 14	Dec. 16	Mar. 20	Mar. 9	Mar. 23	
Palestine, Tex.	31	45	95	40													
Rio Grande Valley:																	
Brownsville, Tex.	25	53	97	26				Jan. 9	( <sup>1</sup> )	Jan. 9	Dec. 26	Jan. 11	( <sup>1</sup> )	Feb. 18	Jan. 25	Feb. 14	
Rio Grande City, Tex.	26	23	98	48						Jan. 6	Feb. 15	Jan. 10	Dec. 16	Mar. 1	Feb. 1	Feb. 14	
Ohio Valley and Tennessee:																	
Chattanooga, Tenn.	35	4	85	15						Apr. 6	Jan. 25	Apr. 5	Feb. 25	Mar. 22	Mar. 10	Mar. 24	
Knoxville, Tenn.	35	56	83	58	Mar. 25	Apr. 19	Apr. 13	Mar. 29	Mar. 26	Apr. 12	Apr. 17	Apr. 10	Apr. 16	Apr. 25	Apr. 11	Apr. 14	
Memphis, Tenn.	35	9	90	3	Feb. 26	Apr. 2	Mar. 13	Mar. 25	Mar. 5	Apr. 5	Mar. 17	Apr. 1	Apr. 16	Mar. 22	Mar. 10	Apr. 4	
Nashville, Tenn.	36	10	86	47	Mar. 10	Apr. 17	Mar. 26	Mar. 26	Mar. 5	Apr. 12	Apr. 12	Apr. 5	Feb. 2	Apr. 3	Mar. 10	Apr. 5	
Louisville, Ky.	38	15	85	45	Apr. 10	Apr. 18	Mar. 31	Mar. 22	Apr. 19	Apr. 8	Mar. 17	Apr. 14	Apr. 11	Apr. 3	Mar. 10	Apr. 4	
Greencastle, Ind.	39	40	86	53													
Indianapolis, Ind.	39	46	86	10	Apr. 29	Apr. 17	Apr. 1	May 4	May 13	Apr. 6	Apr. 7	Apr. 14	Apr. 12	Apr. 24	Apr. 6	Apr. 29	
Cincinnati, Ohio	39	6	84	30	Apr. 29	Apr. 23	Apr. 19	Apr. 21	May 13	Apr. 21	Apr. 12	Apr. 7	Apr. 16	May 24	Apr. 10	Apr. 14	
Columbus, Ohio.	39	58	83	0						Apr. 12	Apr. 13	Apr. 7	May 1	Apr. 24	Apr. 9	Apr. 29	
Pittsburg, Pa.	40	32	80	2	Apr. 29	Apr. 23	May 1	Apr. 3	May 16	May 3	May 1	Apr. 15	May 3	May 17	Apr. 7	Apr. 29	
Lower Lakes:																	
Buffalo, N. Y.	43	53	78	35	May 7	May 3	Apr. 26	May 5	Mar. 30	May 8	Mar. 31	Apr. 15	Apr. 25	Apr. 30	Apr. 30	May 3	
Oswego, N. Y.	43	29	76	35	May 6	Apr. 23	Apr. 29	Apr. 8	Mar. 26	May 12	May 1	Apr. 15	Apr. 3	Apr. 29	Apr. 8	May 16	
Rochester, N. Y.	43	8	77	42	May 7	May 1	May 1	May 3	May 14	May 12	May 1	Apr. 15	May 2	Apr. 29	May 13	May 2	
Erie, Pa.	42	7	80	5	May 7	May 2	Apr. 29	May 1	May 26	Apr. 31	Apr. 12	Apr. 15	May 2	Apr. 30	Apr. 12	May 2	
Cleveland, Ohio.	41	30	81	42	Apr. 29	May 17	May 1	Apr. 6	Mar. 26	Apr. 28	Mar. 31	May 19	Apr. 12	May 17	Apr. 21	Apr. 29	
Sandusky, Ohio.	41	25	82	40					Mar. 20	Apr. 23	Mar. 31	Apr. 19	Apr. 12	May 17	Apr. 6	Apr. 14	
Toledo, Ohio.	41	40	83	31	Apr. 29	May 3	May 1	Apr. 4	Mar. 29	May 2	Apr. 14	Apr. 19	May 24	Apr. 29	Apr. 6	Apr. 14	
Detroit, Mich.	42	20	83	3	May 7	May 3	May 1	May 2	May 13	May 2	May 14	Apr. 9	May 2	Apr. 24	Apr. 7	Mar. 28	
Upper Lakes:																	
Alpena, Mich.	45	5	83	30	May 6	May 16	May 3	May 6	May 15	May 7	May 1	Apr. 29	May 22	May 8	May 3	June 29	

Beaumont, Mich.....	45 48	57 5	May 18	May 6	May 4	May 2	May 15	May 8	Apr. 30	May 6	May 16	Apr. 11	Apr. 24	May 3	June 29
Grand Haven, Mich.....	43 5	86 18	Apr. 29	May 2	May 1	Apr. 5	May 11	May 7	Apr. 8	Apr. 16	May 2	May 11	Apr. 21	Apr. 21	June 10
Marquette, Mich.....	43 47	84 39	May 6	May 16	May 4	May 26	May 18	June 5	Apr. 30	June 6	June 11	May 23	Apr. 30	Apr. 28	May 28
Port Huron, Mich.....	43 0	87 24	May 2	May 2	May 30	May 7	May 13	June 18	Apr. 11	Apr. 12	May 2	May 13	May 23	May 23	May 11
Chicago, Ill.....	41 52	87 54	Apr. 22	May 2	May 1	Apr. 8	May 13	May 28	Apr. 3	Apr. 12	Apr. 7	May 2	Apr. 24	Apr. 2	May 10
Illwaukee, Wis.....	43 2	87 54	Apr. 22	May 2	May 1	May 8	May 13	May 28	Apr. 3	Apr. 12	Apr. 7	May 2	Apr. 24	Apr. 2	May 10
Duluth, Minn.....	46 48	92 6	Apr. 23	May 16	May 6	May 2	May 13	May 28	Apr. 3	Apr. 12	Apr. 7	May 2	Apr. 24	Apr. 2	May 10
Upper Mississippi Valley:															
Saint Paul, Minn.....	41 58	98 2	Apr. 26	May 5	May 4	Apr. 30	Apr. 6	Apr. 17	May 21	Apr. 16	May 23	Apr. 19	Apr. 21	Apr. 21	May 7
La Crosse, Wis.....	43 49	91 15	Apr. 24	May 1	May 18	May 1	May 13	May 28	Apr. 11	Apr. 14	May 23	May 22	Apr. 21	Apr. 21	May 11
Davenport, Iowa.....	41 30	90 38	Apr. 28	May 6	May 1	Apr. 30	May 28	Apr. 11	Apr. 11	Apr. 14	May 23	May 22	Apr. 21	Apr. 21	May 9
Des Moines, Iowa.....	41 25	93 37	Apr. 28	May 6	May 1	Apr. 30	May 28	Apr. 11	Apr. 11	Apr. 14	May 23	May 22	Apr. 21	Apr. 21	May 9
Dubuque, Iowa.....	42 30	90 44	Apr. 17	May 2	May 1	May 1	May 20	May 16	Apr. 11	Apr. 16	May 23	May 22	Apr. 21	Apr. 21	May 10
Keokuk, Iowa.....	40 22	91 25	Apr. 23	May 2	Apr. 2	Apr. 3	May 20	Apr. 4	Apr. 17	Apr. 16	May 23	May 22	Apr. 21	Apr. 21	May 8
Calumet, Ill.....	37 0	89 10	Mar. 12	Apr. 17	Mar. 29	Apr. 30	Feb. 28	Apr. 8	Apr. 17	Apr. 14	May 11	May 22	Mar. 22	Mar. 22	May 8
Springfield, Ill.....	39 48	89 39	Apr. 29	May 2	Mar. 30	Apr. 30	Feb. 27	Mar. 13	Apr. 17	Apr. 14	May 11	May 22	Mar. 22	Mar. 22	May 10
Saint Louis, Mo.....	38 38	90 12	Apr. 29	May 2	Mar. 30	Apr. 30	Feb. 27	Mar. 13	Apr. 17	Apr. 14	May 11	May 22	Mar. 22	Mar. 22	May 10
Missouri Valley:															
Lamar, Mo.....	27 32	94 15	Apr. 17	May 1	Apr. 5	Apr. 2	Apr. 4	Mar. 17	Mar. 20	Apr. 13	May 16	Apr. 7	Apr. 8	Apr. 8	May 8
Leavenworth, Kans.....	39 19	94 57	Apr. 17	May 1	Apr. 5	Apr. 2	Apr. 4	Mar. 17	Mar. 20	Apr. 13	May 16	Apr. 7	Apr. 8	Apr. 8	May 8
Omaha, Neb.....	41 16	95 56	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	May 23	Apr. 12	Apr. 10	Apr. 10	May 7
Bennett, Fort, Dak.....	44 43	100 39	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	May 23	Apr. 12	Apr. 10	Apr. 10	May 7
Huron, Dak.....	44 21	98 9	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	May 23	Apr. 12	Apr. 10	Apr. 10	May 7
Yankton, Dak.....	42 54	97 28	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	May 23	Apr. 12	Apr. 10	Apr. 10	May 7
Extreme Northwest:															
Moorhead, Minn.....	46 53	96 44	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	May 23	Apr. 12	Apr. 10	Apr. 10	May 7
Saint Vincent, Minn.....	46 56	97 14	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	May 23	Apr. 12	Apr. 10	Apr. 10	May 7
Bismarck, Dak.....	46 47	100 38	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	May 23	Apr. 12	Apr. 10	Apr. 10	May 7
Buford, Fort, Dak.....	46 0	108 56	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	May 23	Apr. 12	Apr. 10	Apr. 10	May 7
Totten, Fort, Dak.....	47 57	98 57	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	May 23	Apr. 12	Apr. 10	Apr. 10	May 7
Northern Slope:															
Assiniboine, Fort, Mont.....	49 22	109 42	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	May 23	Apr. 12	Apr. 10	Apr. 10	May 7
Benton, Fort, Mont.....	47 50	110 40	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	May 23	Apr. 12	Apr. 10	Apr. 10	May 7
Guster, Fort, Mont.....	45 42	107 24	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	May 23	Apr. 12	Apr. 10	Apr. 10	May 7
Helena, Mont.....	46 24	113 4	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	May 23	Apr. 12	Apr. 10	Apr. 10	May 7
Marina, Fort, Mont.....	47 12	109 10	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	May 23	Apr. 12	Apr. 10	Apr. 10	May 7
Poplar River, Mont.....	46 8	106 10	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	May 23	Apr. 12	Apr. 10	Apr. 10	May 7
Shaw, Fort, Mont.....	47 31	111 48	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	May 23	Apr. 12	Apr. 10	Apr. 10	May 7
Deadwood, Dak.....	44 23	108 43	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	May 23	Apr. 12	Apr. 10	Apr. 10	May 7
Chadron, Wyo.....	41 8	104 46	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	May 23	Apr. 12	Apr. 10	Apr. 10	May 7
North Platte, Nebr.....	41 8	100 45	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	May 23	Apr. 12	Apr. 10	Apr. 10	May 7
Middle Slope:															
Denver, Colo.....	39 45	105 0	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	May 23	Apr. 12	Apr. 10	Apr. 10	May 7
Pike's Peak, Colo.....	38 50	108 2	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	May 23	Apr. 12	Apr. 10	Apr. 10	May 7
West La Junta, Colo.....	38 44	108 12	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	May 23	Apr. 12	Apr. 10	Apr. 10	May 7
Dodge City, Kans.....	37 45	109 0	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	May 23	Apr. 12	Apr. 10	Apr. 10	May 7
Elliot, Fort, Tex.....	36 30	100 21	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	May 23	Apr. 12	Apr. 10	Apr. 10	May 7
Southern Slope:															
Salt, Fort, Ind. T.....	34 40	98 23	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	May 23	Apr. 12	Apr. 10	Apr. 10	May 7

Frost every month in the year.

No record.

No killing frost reported.

*Dates of the last killing frost at stations of the Signal Service, United States Army, &c.—Continued.*

Stations.	Latitude.	Longitude.	WINTER OF—											
			1873-74.	1874-75.	1875-76.	1876-77.	1877-78.	1878-79.	1879-80.	1880-81.	1881-82.	1882-83.	1883-84.	1884-85.
Florida Peninsula—Continued:														
Key West, Fla.	24 24	81 49												( <sup>1</sup> )
Sanford, Fla.	28 48	81 23												( <sup>1</sup> )
Eastern Gulf States:														
Atlanta, Ga.	33 45	84 23												
Pensacola, Fla.	30 25	87 13												
Mobile, Ala.	30 41	88 2												
Montgomery, Ala.	32 23	86 18												
Vicksburg, Miss.	32 53	90 53												
New Orleans, La.	29 56	90 4												
Western Gulf States:														
Shreveport, La.	32 30	93 40												
Fort Smith, Ark.	33 23	94 34												
Little Rock, Ark.	34 45	92 6												
Galveston, Tex.	29 18	94 47												
Indianola, Tex.	29 32	96 31												
Palestine, Tex.	31 45	95 40												
Rio Grande Valley:														
Brownsville, Tex.	28 53	97 26												
Rio Grande City, Tex.	28 23	98 48												
Ohio Valley and Tennessee:														
Chattanooga, Tenn.	35 4	85 15												
Knoxville, Tenn.	35 56	83 58												
Memphis, Tenn.	35 9	90 3												
Nashville, Tenn.	36 10	86 47												
Louisville, Ky.	38 15	85 45												
Greencastle, Ind.	39 40	86 53												
Indianapolis, Ind.	39 46	86 10												
Cincinnati, Ohio	39 6	84 30												
Columbus, Ohio	39 58	83 0												
Pittsburg, Pa.	40 32	80 2												
Lower Lakes:														
Buffalo, N. Y.	42 53	78 53												
Oswego, N. Y.	43 29	76 35												
Rochester, N. Y.	43 8	77 42												
Elko, Pa.	42 7	80 5												
Cleveland, Ohio	41 20	81 42												
Sandusky, Ohio	41 25	82 40												
Toledo, Ohio	41 20	83 31												
Detroit, Mich.	42 20	83 3												
Upper Lakes:														
Alpena, Mich.	45 5	83 30												



Escanaba, Mich.....	45 48	87 5	May 18	May 2	May 6	May 4	May 3	May 15	May 8	Apr. 20	May 6	May 16	Apr. 24	May 21	June 29
Grand Haven, Mich.....	45 47	84 18	Apr. 29	May 2	May 2	May 1	Apr. 5	May 11	May 7	Mar. 8	Apr. 16	May 2	Apr. 11	Apr. 21	June 10
Maclean City, Mich.....	45 47	84 23	May 0	May 16	May 10	May 4	May 20	May 18	June 5	Apr. 80	June 6	June 11	Apr. 23	Apr. 23	June 11
Marquette, Mich.....	46 34	82 24	May 0	May 16	May 10	May 4	May 20	May 18	June 5	Apr. 80	June 6	June 11	Apr. 23	Apr. 23	June 11
Port Huron, Mich.....	43 0	82 24	Apr. 24	May 2	May 2	May 30	Apr. 30	May 13	Apr. 8	Apr. 12	Apr. 7	May 25	Apr. 24	Apr. 24	May 10
Chicago, Ill.....	41 52	87 66	Apr. 23	May 2	May 2	May 1	May 3	Mar. 29	Apr. 2	Mar. 80	Apr. 14	May 2	May 21	Apr. 20	May 11
Illwaukee, Wis.....	43 2	87 64	Apr. 23	May 16	May 10	May 4	May 2	May 12	May 7	Apr. 80	May 3	May 1	May 11	Apr. 29	June 8
Duluth, Minn.....	46 48	92 6	Apr. 23	May 16	May 10	May 4	May 2	May 12	May 7	Apr. 80	May 3	May 1	May 11	Apr. 29	June 8
Upper Mississippi Valley:															
Saint Paul, Minn.....	41 58	91 3	Apr. 26	May 2	May 5	May 4	Apr. 30	Apr. 6	May 17	May 21	Apr. 16	May 22	Apr. 19	Apr. 21	May 7
La Crosse, Wis.....	41 58	91 15	Apr. 26	May 2	May 5	May 4	Apr. 30	Apr. 6	May 17	May 21	Apr. 16	May 22	Apr. 19	Apr. 21	May 7
Davenport, Iowa.....	41 30	90 88	Apr. 26	May 6	May 1	May 1	Apr. 30	Mar. 28	Apr. 11	Apr. 19	Apr. 14	May 22	Apr. 22	Apr. 10	May 9
Des Moines, Iowa.....	41 35	90 87	Apr. 26	May 6	May 1	May 1	Apr. 30	Mar. 28	Apr. 11	Apr. 19	Apr. 14	May 22	Apr. 22	Apr. 10	May 9
Dubuque, Iowa.....	42 30	90 44	Apr. 23	May 2	May 2	May 1	May 1	Mar. 20	May 16	Apr. 11	Apr. 16	May 22	Apr. 21	Apr. 21	May 10
Keokuk, Iowa.....	40 22	91 26	Apr. 23	May 2	May 2	May 1	Apr. 30	Mar. 20	May 16	Apr. 11	Apr. 16	May 22	Apr. 21	Apr. 21	May 10
Calao, Ill.....	37 0	80 10	Mar. 12	Apr. 17	Apr. 17	Mar. 29	Apr. 30	Feb. 28	Apr. 8	Apr. 17	Apr. 14	May 25	Mar. 22	Mar. 10	Apr. 8
Springfield, Ill.....	39 48	89 82	Apr. 29	May 2	May 2	Mar. 30	Apr. 30	Feb. 27	Mar. 13	Mar. 2	Apr. 14	Mar. 11	Mar. 29	Mar. 14	Apr. 10
Saint Louis, Mo.....	38 38	90 12	Apr. 29	May 2	May 2	Mar. 30	Apr. 30	Feb. 27	Mar. 13	Mar. 2	Apr. 14	Mar. 11	Mar. 29	Mar. 14	Apr. 10
Missouri Valley:															
Lamar, Mo.....	37 82	94 15	Apr. 17	May 1	Apr. 5	Apr. 2	Apr. 2	Apr. 4	Mar. 17	Mar. 20	Apr. 13	Mar. 16	Apr. 7	Apr. 8	May 8
Leavenworth, Kans.....	38 10	94 57	Apr. 17	May 1	Apr. 5	Apr. 2	Apr. 2	Apr. 4	Mar. 17	Mar. 20	Apr. 13	Mar. 16	Apr. 7	Apr. 8	May 8
Omaha, Nebr.....	41 16	95 56	Apr. 23	May 4	Apr. 14	Apr. 2	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	Apr. 12	Apr. 1	Apr. 10	May 7
Bennett, Fort, Dak.....	44 43	100 89	Apr. 23	May 4	Apr. 14	Apr. 2	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	Apr. 12	Apr. 1	Apr. 10	May 7
Huron, Dak.....	44 31	98 9	Apr. 23	May 4	Apr. 14	Apr. 2	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	Apr. 12	Apr. 1	Apr. 10	May 7
Yankton, Dak.....	42 54	97 28	Apr. 23	May 4	Apr. 14	Apr. 2	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	Apr. 12	Apr. 1	Apr. 10	May 7
Extreme Northwest:															
Moorhead, Minn.....	46 52	96 44	Apr. 23	May 4	Apr. 14	Apr. 2	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	Apr. 12	Apr. 1	Apr. 10	May 7
Saint Vincent, Minn.....	46 56	97 14	Apr. 23	May 4	Apr. 14	Apr. 2	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	Apr. 12	Apr. 1	Apr. 10	May 7
Bismarck, Dak.....	46 47	100 38	Apr. 23	May 4	Apr. 14	Apr. 2	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	Apr. 12	Apr. 1	Apr. 10	May 7
Buford, Fort, Dak.....	46 0	103 56	Apr. 23	May 4	Apr. 14	Apr. 2	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	Apr. 12	Apr. 1	Apr. 10	May 7
Totten, Fort, Dak.....	47 57	98 57	Apr. 23	May 4	Apr. 14	Apr. 2	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 1	Apr. 12	Apr. 1	Apr. 10	May 7
Northern Slope:															
Assiniboine, Fort, Mont.....	48 32	109 42	Apr. 23	May 28	June 1	June 1	June 1	June 1	June 1	June 1	June 1	June 1	June 1	June 1	June 1
Benton, Fort, Mont.....	47 50	110 40	Apr. 23	May 28	June 1	June 1	June 1	June 1	June 1	June 1	June 1	June 1	June 1	June 1	June 1
Custer, Fort, Mont.....	45 42	107 34	Apr. 23	May 28	June 1	June 1	June 1	June 1	June 1	June 1	June 1	June 1	June 1	June 1	June 1
Helena, Mont.....	46 34	112 4	Apr. 23	May 28	June 1	June 1	June 1	June 1	June 1	June 1	June 1	June 1	June 1	June 1	June 1
Maginnis, Fort, Mont.....	47 12	109 10	Apr. 23	May 28	June 1	June 1	June 1	June 1	June 1	June 1	June 1	June 1	June 1	June 1	June 1
Poplar River, Mont.....	48 8	105 10	Apr. 23	May 28	June 1	June 1	June 1	June 1	June 1	June 1	June 1	June 1	June 1	June 1	June 1
Shaw, Fort, Mont.....	47 31	111 48	Apr. 23	May 28	June 1	June 1	June 1	June 1	June 1	June 1	June 1	June 1	June 1	June 1	June 1
Deadwood, Dak.....	44 23	108 43	Apr. 15	May 15	June 9	June 9	June 9	June 9	June 9	June 9	June 9	June 9	June 9	June 9	June 9
Cheyenne, Wyo.....	41 8	104 48	Apr. 15	May 15	June 9	June 9	June 9	June 9	June 9	June 9	June 9	June 9	June 9	June 9	June 9
North Platte, Nebr.....	41 8	100 45	Apr. 15	May 15	June 9	June 9	June 9	June 9	June 9	June 9	June 9	June 9	June 9	June 9	June 9
Middle Slope:															
Denver, Colo.....	39 45	105 0	May 4	May 8	May 6	May 6	May 6	May 10	May 10	May 11	Mar. 29	Apr. 18	May 26	May 5	May 11
Pike's Peak, Colo.....	38 50	105 2	May 4	May 8	May 6	May 6	May 6	May 10	May 10	May 11	Mar. 29	Apr. 18	May 26	May 5	May 11
West Las Animas, Colo.....	38 4	108 12	Apr. 26	May 26	Apr. 14	Apr. 14	Apr. 30	Apr. 4	Apr. 11	Apr. 23	Apr. 14	Apr. 23	Apr. 25	Apr. 6	Apr. 25
Dodge City, Kans.....	37 45	108 0	Apr. 26	May 26	Apr. 14	Apr. 14	Apr. 30	Apr. 4	Apr. 11	Apr. 23	Apr. 14	Apr. 23	Apr. 25	Apr. 6	Apr. 25
Elliott, Fort, Tex.....	35 30	100 21	Apr. 26	May 26	Apr. 14	Apr. 14	Apr. 30	Apr. 4	Apr. 11	Apr. 23	Apr. 14	Apr. 23	Apr. 25	Apr. 6	Apr. 25
Southern Slope:															
Sill, Fort, Ind. T.....	34 40	98 23	Apr. 26	May 26	Apr. 14	Apr. 14	Apr. 30	Apr. 4	Apr. 11	Apr. 23	Apr. 14	Apr. 23	Apr. 25	Apr. 6	Apr. 25

\* Frost every month in the year.

\* No record.

\* No killing frost reported.

*Dates of the last killing frost at stations of the Signal Service, United States Army, &c.—Continued.*

Stations.	Latitude.	Longitude.	WINTER OF—											
			1873-74.	1874-75.	1875-76.	1876-77.	1877-78.	1878-79.	1879-80.	1880-81.	1881-82.	1882-83.	1883-84.	1884-85.
Southern Slope—Continued:	° ' "	° ' "												
Cochise, Fort, Tex.....	31 25	100 24					Mar. 4	Mar. 18	Apr. 9	Mar. 19	Mar. 9	Mar. 19	Mar. 14	Mar. 23
Davis, Fort, Tex.....	30 38	103 54					Apr. 3	Apr. 8	Apr. 9	Mar. 21	Apr. 15	Apr. 6	Apr. 22	Mar. 29
Stockton, Fort, Tex.....	30 53	102 53					Mar. 4	Mar. 19	Mar. 19	Apr. 14	Mar. 8	Apr. 15	Apr. 21	Feb. 11
Southern Plateau:														
El Paso, Tex.....	31 47	106 30						Apr. 10	Mar. 16	Apr. 14	Apr. 22	Apr. 16	Mar. 28	Mar. 7

## APPENDIX 44.

*Dates of the first snowfall at stations of the Signal Service, United States Army, east of the Rocky Mountains for the winter of 1884-85.*

Stations.	Latitude.	Longitude.	Date.	Stations.	Latitude.	Longitude.	Date.
	° /	° /	1884-85.		° /	° /	1884-85.
<b>New England:</b>				<b>Lower Lakes:</b>			
Eastport, Me. ....	44 54	66 59	Oct. 14	Buffalo, N. Y. ....	42 53	78 53	Oct. 23
Portland, Me. ....	43 39	70 15	Oct. 16	Oswego, N. Y. ....	42 29	76 25	Oct. 23
Mount Washington, N. H. ....	44 16	71 18	July 21	Rochester, N. Y. ....	43 8	77 42	Oct. 23
Boston, Mass. ....	42 21	71 4	Oct. 31	Erie, Pa. ....	42 7	80 5	Oct. 23
Block Island, R. I. ....	41 10	71 36	Dec. 12	Cleveland, Ohio. ....	41 30	81 42	Oct. 23
New Haven, Conn. ....	41 18	72 56	Nov. 18	Sandusky, Ohio. ....	41 25	82 40	Oct. 23
New London, Conn. ....	41 21	72 5	Nov. 19	Toledo, Ohio. ....	41 40	83 34	Oct. 23
<b>Middle Atlantic States:</b>				Detroit, Mich. ....	42 20	83 3	Oct. 23
Albany, N. Y. ....	42 39	73 45	Oct. 25	<b>Upper Lakes:</b>			
New York City. ....	40 43	74 0	Nov. 18	Alpena, Mich. ....	45 5	83 30	Oct. 23
Philadelphia, Pa. ....	39 57	75 9	Nov. 18	Escanaba, Mich. ....	45 48	87 5	Oct. 22
Atlantic City, N. J. ....	39 22	74 25	Dec. 18	Grand Haven, Mich. ....	43 5	86 18	Oct. 22
Barnegat City, N. J. ....	39 46	74 6	Dec. 18	Mackinaw City, Mich. ....	45 47	84 39	Oct. 22
Capo May, N. J. ....	38 56	74 58	Dec. 18	Marquette, Mich. ....	46 34	87 24	Oct. 22
Sandy Hook, N. J. ....	40 28	74 0	Dec. 18	Port Huron, Mich. ....	43 0	82 26	Oct. 23
Del. Breakwater. ....				Chicago, Ill. ....	41 52	87 38	Oct. 23
Del. ....	38 48	75 10	Dec. 18	Milwaukee, Wis. ....	43 2	87 54	Oct. 24
Baltimore, Md. ....	39 18	76 37	Nov. 3	Duluth, Minn. ....	46 48	92 6	Oct. 20
Washington City. ....	38 54	77 2	Nov. 6	<b>Upper Mississippi Valley:</b>			
Capo Henry, Va. ....	36 56	76 0	Dec. 18	Saint Paul, Minn. ....	44 58	93 3	Oct. 22
Chincoteague, Va. ....	37 55	75 23	Dec. 18	La Crosse, Wis. ....	43 49	91 15	Oct. 22
Lynchburg, Va. ....	37 25	79 9	Nov. 30	Davenport, Iowa. ....	41 30	90 38	Nov. 4
Norfolk, Va. ....	36 51	76 17	Dec. 18	Des Moines, Iowa. ....	41 36	93 37	Nov. 22
<b>South Atlantic States:</b>				Dubuque, Iowa. ....	42 30	90 44	Oct. 22
Charlotte, N. C. ....	35 13	80 51	Mar. 17	Keokuk, Iowa. ....	40 22	91 26	Nov. 17
Hatteras, N. C. ....	35 15	75 40	Dec. 19	Cairo, Ill. ....	37 0	89 10	Nov. 27
Kitty Hawk, N. C. ....	36 0	75 42	Dec. 19	Springfield, Ill. ....	39 48	89 39	Nov. 17
Macon, Fort, N. C. ....	34 42	76 40	Mar. 18	Saint Louis, Mo. ....	38 38	90 12	Nov. 18
Smithville, N. C. ....	33 55	78 1	( <sup>1</sup> )	<b>Missouri Valley:</b>			
Wilmington, N. C. ....	34 14	77 57	( <sup>1</sup> )	Leavenworth, Kans. ....	39 19	94 57	Nov. 17
Charleston, S. C. ....	32 47	79 56	( <sup>1</sup> )	Omaha, Nebr. ....	41 16	95 56	Nov. 18
Augusta, Ga. ....	32 28	81 54	Feb. 12	Bennett, Fort, Dak. ....	44 43	100 39	Oct. 20
Savannah, Ga. ....	32 5	81 5	( <sup>1</sup> )	Huron, Dak. ....	44 21	98 9	Oct. 20
Jacksonville, Fla. ....	30 20	81 38	( <sup>1</sup> )	Yankton, Dak. ....	42 54	97 28	Oct. 7
<b>Florida Peninsula:</b>				<b>Extreme Northwest:</b>			
Cedar Keys, Fla. ....	29 8	83 2	( <sup>1</sup> )	Moorhead, Minn. ....	46 52	96 44	Oct. 21
Key West, Fla. ....	24 34	81 49	( <sup>1</sup> )	Saint Vincent, Minn. ....	48 56	97 14	Oct. 21
Sanford, Fla. ....	28 48	81 23	( <sup>1</sup> )	Bismarck, Dak. ....	46 47	100 33	Nov. 1
<b>Eastern Gulf States:</b>				Buford, Fort, Dak. ....	43 0	103 56	Oct. 21
Atlanta, Ga. ....	33 45	84 23	Dec. 18	Totten, Fort, Dak. ....	47 57	98 57	Oct. 26
Pensacola, Fla. ....	30 25	87 13	( <sup>1</sup> )	<b>Northern Slope:</b>			
Mobile, Ala. ....	30 41	88 2	( <sup>1</sup> )	Asinaboline, Fort, Mont. ....	48 32	109 42	Oct. 3
Montgomery, Ala. ....	32 23	86 18	Feb. 13	Benton, Fort, Mont. ....	47 50	110 40	Oct. 2
Vicksburg, Miss. ....	32 22	90 53	Dec. 18	Custer, Fort, Mont. ....	45 42	107 34	Oct. 19
New Orleans, La. ....	29 58	90 4	( <sup>1</sup> )	Helena, Mont. ....	46 34	112 4	Oct. 1
<b>Western Gulf States:</b>				Maginnis, Fort, Mont. ....	47 12	109 10	Sept. 6
Shreveport, La. ....	32 30	93 40	Jan. 16	Poplar River, Mont. ....	48 8	105 10	Oct. 20
Fort Smith, Ark. ....	35 22	94 24	Dec. 13	Shaw, Fort, Mont. ....	47 31	111 48	Oct. 2
Little Rock, Ark. ....	34 45	92 6	Jan. 16	Deadwood, Dak. ....	44 23	103 43	Sept. 29
Galveston, Tex. ....	29 18	94 47	( <sup>1</sup> )	Cheyenne, Wyo. ....	41 8	104 48	Oct. 26
Indianola, Tex. ....	28 32	96 31	( <sup>1</sup> )	North Platte, Nebr. ....	41 8	100 45	Oct. 7
Palestine, Tex. ....	31 45	95 40	Jan. 16	<b>Middle Slope:</b>			
<b>Rio Grande Valley:</b>				Denver, Colo. ....	39 45	105 0	Oct. 7
Brownsville, Tex. ....	26 53	97 26	( <sup>1</sup> )	Pike's Peak, Colo. ....	38 50	105 2	( <sup>2</sup> )
Rio Grande City, Tex. ....	26 23	98 43	( <sup>1</sup> )	West Las Animas, Colo. ....	38 4	103 13	Nov. 17
<b>Ohio Valley and Tennessee:</b>				Dodge City, Kans. ....	37 45	100 0	Nov. 17
Chatanooga, Tenn. ....	35 4	85 15	Dec. 18	Elliott, Fort, Tex. ....	35 30	100 21	Dec. 10
Knoxville, Tenn. ....	35 56	83 53	Dec. 18	<b>Southern Slope:</b>			
Memphis, Tenn. ....	35 9	90 3	Dec. 17	Sill, Fort, Ind. T. ....	34 40	98 23	Dec. 11
Nashville, Tenn. ....	36 10	86 47	Nov. 28	Concho, Fort, Tex. ....	31 25	100 34	Jan. 15
Louisville, Ky. ....	38 15	85 45	Nov. 18	Davis, Fort, Tex. ....	30 33	103 58	Dec. 11
Greencastle, Ind. ....	39 40	86 53	Nov. 23	Stockton, Fort, Tex. ....	30 53	102 53	Jan. 4
Indianapolis, Ind. ....	39 48	86 10	Nov. 5	<b>Southern Plateau:</b>			
Cincinnati, Ohio. ....	39 6	84 30	Nov. 18	El Paso, Tex. ....	31 47	106 30	Dec. 11
Columbus, Ohio. ....	39 58	83 0	Oct. 23				
Pittsburg, Pa. ....	40 32	80 2	Oct. 23				

<sup>1</sup> No snow observed.<sup>2</sup> Snow every month in the year.

## APPENDIX 45.

*Dates of the last snowfall at stations of the Signal Service, United States Army, east of the Rocky Mountains for the winter of 1884-'85.*

Stations.	Latitude.	Longitude.	Date.	Stations.	Latitude.	Longitude.	Date.
<b>New England:</b>	° /	° /	1884-'85	<b>Lower Lakes—Cont'd:</b>	° /	° /	1884-'85
Eastport, Me. ....	44 51	66 59	May 2	Oswego, N. Y. ....	43 29	76 35	May 10
Portland, Me. ....	43 39	70 15	May 2	Rochester, N. Y. ....	43 8	77 42	May 10
Mount Washington, N. H. ....	44 16	71 18	( <sup>1</sup> )	Erie, Pa. ....	42 7	80 5	May 9
Boston, Mass. ....	42 21	71 4	Apr. 2	Cleveland, Ohio. ....	41 30	81 42	May 9
Block Island, R. I. ....	41 10	71 38	Mar. 29	Sandusky, Ohio. ....	41 25	82 40	May 9
New Haven, Conn. ....	41 18	72 56	Apr. 11	Toledo, Ohio. ....	41 40	83 34	May 9
New London, Conn. ....	41 21	72 5	Mar. 29	Detroit, Mich. ....	42 20	83 3	Apr. 14
<b>Middle Atlantic States:</b>				<b>Upper Lakes:</b>			
Albany, N. Y. ....	42 39	73 45	May 1	Alpena, Mich. ....	45 5	83 30	May 10
New York City. ....	40 43	74 0	Apr. 29	Escanaba, Mich. ....	45 48	87 5	May 10
Philadelphia, Pa. ....	39 57	75 9	Apr. 15	Grand Haven, Mich. ....	43 5	86 18	May 8
Atlantic City, N. J. ....	39 22	74 25	Apr. 11	Mackinaw City, Mich. ....	45 47	84 39	May 8
Barnegat City, N. J. ....	39 46	74 0	Apr. 29	Marquette, Mich. ....	46 34	87 24	May 10
Cape May, N. J. ....	38 56	74 58	Mar. 22	Port Huron, Mich. ....	42 0	82 26	May 9
Sandy Hook, N. J. ....	40 28	74 0	Apr. 11	Chicago, Ill. ....	41 52	87 38	Apr. 14
Baltimore, Md. ....	39 18	76 37	Apr. 11	Milwaukee, Wis. ....	43 2	87 54	Apr. 14
Washington City. ....	38 54	77 2	Apr. 11	Duluth, Minn. ....	46 48	92 6	May 7
Cape Henry, Va. ....	36 56	76 0	Apr. 10	<b>Upper Mississippi Valley:</b>			
Chincoteague, Va. ....	37 55	75 23	Mar. 22	Saint Paul, Minn. ....	44 58	93 3	May 8
Lynchburg, Va. ....	37 25	79 9	Apr. 13	La Crosse, Wis. ....	43 49	91 15	May 9
Norfolk, Va. ....	36 51	76 17	Apr. 13	Davenport, Iowa. ....	41 20	90 38	Apr. 12
<b>South Atlantic States:</b>				Des Moines, Iowa. ....	41 35	93 37	Apr. 9
Charlottesville, N. C. ....	35 13	80 51	Mar. 23	Dubuque, Iowa. ....	42 30	90 44	May 7
Hatteras, N. C. ....	35 15	75 40	Mar. 23	Keokuk, Iowa. ....	40 22	91 26	Apr. 9
Kitty Hawk, N. C. ....	36 0	75 42	Mar. 23	Calro, Ill. ....	37 0	89 10	Mar. 28
Macon, Fort. N. C. ....	34 42	76 40	Mar. 23	Springfield, Ill. ....	39 48	89 39	Apr. 9
Smithville, N. C. ....	33 53	78 1	( <sup>1</sup> )	Saint Louis, Mo. ....	38 38	90 12	Apr. 9
Wilmington, N. C. ....	34 14	77 57	Mar. 23	<b>Missouri Valley:</b>			
Charleston, S. C. ....	32 47	79 56	( <sup>1</sup> )	Lamar, Mo. ....	37 32	94 15	May 7
Augusta, Ga. ....	33 28	81 64	Mar. 23	Leavenworth, Kans. ....	39 19	94 57	Mar. 28
Savannah, Ga. ....	32 5	81 5	( <sup>1</sup> )	Omaha, Nebr. ....	41 16	93 56	Apr. 9
Jacksonville, Fla. ....	30 20	81 39	( <sup>1</sup> )	Bennett, Fort. Dak. ....	44 48	100 30	May 6
<b>Florida Peninsula:</b>				Huron, Dak. ....	44 21	98 9	May 6
Cedar Keys, Fla. ....	29 8	83 2	( <sup>1</sup> )	Yankton, Dak. ....	42 54	97 28	May 7
Key West, Fla. ....	24 34	81 49	( <sup>1</sup> )	<b>Extreme Northwest:</b>			
Saunder, Fla. ....	28 48	81 23	( <sup>1</sup> )	Moorhead, Minn. ....	46 52	96 44	Mar. 8
<b>Eastern Gulf States:</b>				Saint Vincent, Minn. ....	48 56	97 14	May 8
Atlanta, Ga. ....	33 45	84 23	Mar. 18	Blamark, Dak. ....	46 47	100 38	May 7
Pensacola, Fla. ....	30 26	87 13	( <sup>1</sup> )	Buford, Fort. Dak. ....	48 0	103 50	May 6
Mobile, Ala. ....	30 41	88 2	( <sup>1</sup> )	Totten, Fort. Dak. ....	47 57	98 57	May 7
Montgomery, Ala. ....	32 23	86 18	Feb. 12	<b>Northern Slope:</b>			
Vicksburg, Miss. ....	32 28	90 53	Feb. 12	Assinaboine, Fort. Mont. ....	48 32	100 42	May 7
New Orleans, La. ....	29 58	90 4	( <sup>1</sup> )	Benton, Fort. Mont. ....	47 50	110 40	Apr. 29
<b>Western Gulf States:</b>				Custer, Fort. Mont. ....	45 42	107 34	Apr. 21
Shreveport, La. ....	32 30	93 40	Feb. 21	Helena, Mont. ....	46 34	112 4	June 7
Fort Smith, Ark. ....	35 22	94 24	Feb. 16	Maginnis, F. rt. Mont. ....	47 13	109 10	May 6
Little Rock, Ark. ....	34 45	92 0	Feb. 16	Poplar River, Mont. ....	48 8	103 10	May 7
Galveston, Tex. ....	29 18	94 47	( <sup>1</sup> )	Shaw, Fort. Mont. ....	47 31	111 48	May 6
Indianola, Tex. ....	28 32	96 31	( <sup>1</sup> )	Deadwood, Dak. ....	44 23	103 43	May 10
Palestine, Tex. ....	31 45	95 40	Feb. 13	Cheyenne, Wyo. ....	41 8	104 48	May 7
<b>Rio Grande Valley:</b>				North Platte, Nebr. ....	41 8	100 45	Mar. 27
Brownsville, Tex. ....	25 53	97 26	( <sup>1</sup> )	<b>Middle Slope:</b>			
Rio Grande City, Tex. ....	26 23	98 48	( <sup>1</sup> )	Denver, Colo. ....	39 45	105 0	May 11
<b>Ohio Valley and Tennessee:</b>				Pike's Peak, Colo. ....	38 50	103 2	( <sup>1</sup> )
Chattanooga, Tenn. ....	35 4	85 15	Mar. 18	West Las Animas, Colo. ....	38 4	103 12	Apr. 24
Knoxville, Tenn. ....	35 56	82 58	Apr. 13	Dodge City, Kans. ....	37 45	100 0	May 7
Memphis, Tenn. ....	35 9	90 3	Mar. 8	Elliott, Fort. Tex. ....	35 30	100 21	Mar. 24
Nashville, Tenn. ....	36 10	86 47	Mar. 28	<b>Southern Slope:</b>			
Louisville, Ky. ....	38 15	85 45	Apr. 14	Sill, Fort. Ind. T. ....	31 40	98 23	Feb. 12
Greencastle, Ind. ....	39 40	80 53	Apr. 14	Concho, Fort. Tex. ....	31 25	100 34	Feb. 13
Indianapolis, Ind. ....	39 46	80 10	Apr. 14	Davis, Fort. Tex. ....	30 38	103 56	Feb. 13
Cincinnati, Ohio. ....	39 0	84 30	Mar. 28	Stockton, Fort. Tex. ....	30 53	102 53	Feb. 13
Columbus, Ohio. ....	39 58	83 0	Apr. 15	<b>Southern Plateau:</b>			
Pittsburg, Pa. ....	40 32	80 2	May 10	El Paso, Tex. ....	31 47	106 30	( <sup>1</sup> )
<b>Lower Lakes:</b>							
Buffalo, N. Y. ....	42 53	78 53	May 9				

<sup>1</sup> Snow every month in the year.<sup>2</sup> No snow observed.

## APPENDIX 46.

*Average movement of the wind at stations of the Signal Service, United States Army, for each month and the year. (Compiled from the commencement of observations at each to and including December, 1884.)*

Stations.	Established.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
<b>New England:</b>		<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>
Eastport, Me.....	Apr. 1, 1873	9, 207.8	9, 617.3	9, 598.8	7, 231.2	6, 212.1	4, 784.7	4, 673.8	4, 251.8	3, 351.7	2, 148.0	8, 476.5	8, 771.0	84, 278.5
Portland, Me.....	Jan. 15, 1871	5, 750.7	5, 673.5	5, 673.5	6, 353.7	5, 792.4	4, 910.2	4, 910.2	4, 315.7	4, 815.5	5, 485.4	8, 865.1	8, 865.1	87, 346.4
Boston, Mass.....	Nov. 1, 1860	7, 349.3	7, 305.7	8, 444.2	7, 372.0	6, 558.5	8, 602.4	8, 534.9	5, 908.9	5, 917.1	6, 719.9	7, 392.2	7, 447.9	81, 009.3
Block Island, R. I.....	Sept. 1, 1870	11, 153.2	11, 153.2	12, 862.2	10, 483.2	10, 430.2	8, 590.2	8, 590.2	7, 085.5	6, 987.8	7, 242.0	11, 838.8	13, 039.0	129, 888.0
New Haven, Conn.....	Dec. 10, 1872	5, 931.4	5, 612.1	6, 976.8	6, 503.2	5, 480.8	4, 591.2	4, 591.2	4, 331.5	4, 882.4	5, 490.3	8, 841.8	8, 968.5	63, 068.9
New York, Conn.....	Jan. 10, 1871	5, 753.5	5, 818.4	6, 784.6	6, 028.6	5, 294.3	4, 591.2	4, 591.2	3, 997.1	4, 410.8	5, 254.4	5, 764.2	5, 635.7	63, 607.2
<b>Middle Atlantic States:</b>														
Albany, N. Y.....	Dec. 22, 1873	5, 787.9	5, 618.0	6, 515.6	6, 019.6	5, 186.4	4, 267.7	3, 881.9	3, 319.8	3, 015.0	4, 522.7	5, 168.8	5, 427.4	59, 240.9
New York City.....	Nov. 1, 1870	7, 380.8	7, 388.7	8, 654.4	7, 235.8	6, 555.6	5, 780.2	5, 734.0	5, 570.6	5, 272.3	6, 988.1	7, 302.0	7, 602.6	82, 440.8
Philadelphia, Pa.....	Jan. 1, 1871	7, 588.2	7, 388.2	8, 815.8	7, 984.8	7, 187.8	6, 461.5	6, 240.0	5, 629.1	5, 945.5	6, 913.9	7, 483.1	7, 483.1	84, 123.4
Atlantic City, N. J.....	Dec. 10, 1873	7, 371.5	7, 371.5	8, 688.2	8, 214.2	7, 854.3	6, 814.2	6, 654.3	6, 014.2	7, 847.5	7, 091.6	8, 885.4	7, 148.6	85, 404.8
Harrisburg, Pa.....	Dec. 10, 1873	10, 100.4	9, 514.3	11, 277.4	9, 867.0	8, 913.5	7, 845.7	7, 364.4	7, 080.0	8, 920.5	9, 424.6	9, 812.5	9, 013.2	111, 242.7
Cape May, N. J.....	May 24, 1871	10, 802.7	11, 040.6	12, 288.6	10, 681.5	9, 409.3	7, 916.7	7, 611.4	7, 323.2	8, 490.0	10, 216.7	11, 352.0	11, 583.4	122, 582.5
Cape Hatteras, N. C.....	Dec. 10, 1873	12, 207.5	9, 989.6	12, 288.6	10, 453.9	9, 254.3	8, 034.0	8, 261.9	6, 314.5	8, 980.2	10, 910.8	11, 835.2	11, 835.2	122, 582.5
Del. Breakwater, Del.....	Jan. 28, 1880	12, 400.2	12, 243.4	14, 371.0	11, 861.8	11, 512.6	9, 034.0	9, 014.4	8, 084.2	10, 910.8	11, 092.6	12, 520.6	12, 746.0	137, 675.0
Baltimore, Md.....	Jan. 1, 1871	4, 153.9	4, 123.3	5, 237.6	4, 947.4	4, 478.2	4, 263.2	4, 153.1	3, 640.0	3, 784.4	4, 981.7	5, 092.6	4, 215.4	51, 023.5
Washington, D. C.....	Nov. 1, 1870	4, 703.1	4, 703.1	5, 344.2	4, 732.6	4, 904.8	4, 263.2	4, 048.8	3, 535.7	3, 814.6	4, 035.8	4, 411.5	4, 047.0	55, 783.5
Cape Henry, Va.....	Dec. 15, 1873	9, 564.5	9, 159.1	10, 837.1	9, 846.5	8, 728.1	7, 983.5	7, 826.5	7, 310.3	8, 000.8	9, 678.9	10, 785.0	10, 649.0	110, 080.2
Chincoteague, Va.....	Mar. 18, 1880	9, 130.5	8, 880.8	10, 681.4	10, 004.6	9, 223.4	7, 678.6	7, 168.6	7, 280.2	8, 000.8	9, 210.6	9, 267.4	9, 684.4	100, 184.5
Lynchburg, Va.....	May 24, 1871	7, 787.8	7, 907.9	8, 680.4	8, 353.2	7, 688.2	6, 878.6	6, 260.7	5, 400.8	6, 980.2	8, 141.2	9, 825.2	9, 727.2	81, 374.0
Norfolk, Va.....	Jan. 1, 1871	5, 588.2	5, 833.1	6, 917.0	6, 267.2	5, 783.1	5, 271.6	4, 904.6	4, 741.5	4, 757.9	5, 380.1	5, 452.5	5, 684.5	67, 168.8
<b>South Atlantic States:</b>														
Charlotte, N. C.....	Oct. 4, 1878	8, 890.0	4, 968.5	4, 988.8	4, 498.2	8, 983.7	3, 745.2	3, 383.8	3, 354.3	3, 447.8	3, 674.5	3, 504.2	3, 801.6	46, 488.8
Savannah, Ga.....	Nov. 7, 1879	8, 112.0	8, 112.0	8, 112.0	8, 112.0	8, 112.0	8, 112.0	8, 112.0	8, 112.0	8, 112.0	8, 112.0	8, 112.0	8, 112.0	8, 112.0
Wilmington, N. C.....	Dec. 1, 1873	11, 041.2	11, 077.3	12, 589.8	10, 092.5	10, 000.0	10, 492.8	10, 180.5	9, 794.5	9, 542.8	10, 114.8	10, 268.7	10, 268.7	127, 044.5
Beaufort, N. C.....	Jan. 15, 1875	11, 847.7	10, 772.3	11, 707.0	11, 528.6	10, 754.9	9, 705.8	9, 087.1	8, 257.3	10, 683.8	11, 604.7	11, 604.7	11, 604.7	127, 044.5
Beaufort, N. C.....	May 23, 1878	8, 417.5	8, 393.0	10, 090.0	10, 090.0	10, 090.0	10, 090.0	10, 090.0	10, 090.0	10, 090.0	10, 090.0	10, 090.0	10, 090.0	114, 644.9
Wilmington, N. C.....	Jan. 1, 1873	8, 417.5	8, 393.0	10, 090.0	10, 090.0	10, 090.0	10, 090.0	10, 090.0	10, 090.0	10, 090.0	10, 090.0	10, 090.0	10, 090.0	114, 644.9
Charleston, S. C.....	Jan. 1, 1873	8, 417.5	8, 393.0	10, 090.0	10, 090.0	10, 090.0	10, 090.0	10, 090.0	10, 090.0	10, 090.0	10, 090.0	10, 090.0	10, 090.0	114, 644.9
Charleston, S. C.....	Jan. 1, 1873	8, 417.5	8, 393.0	10, 090.0	10, 090.0	10, 090.0	10, 090.0	10, 090.0	10, 090.0	10, 090.0	10, 090.0	10, 090.0	10, 090.0	114, 644.9
Augusta, Ga.....	Jan. 1, 1871	4, 651.5	4, 651.5	5, 934.4	5, 466.5	5, 009.8	4, 908.8	4, 701.0	4, 625.4	4, 161.7	4, 514.1	4, 631.3	4, 631.3	53, 073.2
Savannah, Ga.....	Jan. 1, 1871	4, 651.5	4, 651.5	5, 934.4	5, 466.5	5, 009.8	4, 908.8	4, 701.0	4, 625.4	4, 161.7	4, 514.1	4, 631.3	4, 631.3	53, 073.2
Jacksonville, Fla.....	Sep. 11, 1871	4, 243.1	4, 657.5	5, 934.4	5, 466.5	5, 009.8	4, 908.8	4, 701.0	4, 625.4	4, 161.7	4, 514.1	4, 631.3	4, 631.3	53, 073.2
<b>Florida Peninsula:</b>														
Cedar Key, Fla.....	Nov. 7, 1879	8, 706.6	8, 413.0	8, 231.4	7, 478.4	7, 229.4	6, 730.2	6, 224.0	5, 394.8	5, 993.0	6, 986.8	6, 700.2	6, 455.5	80, 887.8
Key West, Fla.....	Nov. 1, 1870	8, 112.0	8, 112.0	8, 112.0	8, 112.0	8, 112.0	8, 112.0	8, 112.0	8, 112.0	8, 112.0	8, 112.0	8, 112.0	8, 112.0	8, 112.0
Sanford, Fla.....	Sep. 1, 1882	5, 972.0	4, 500.0	5, 431.0	4, 987.0	4, 413.9	4, 000.0	3, 553.6	3, 423.0	4, 410.0	5, 614.0	6, 071.9	6, 710.5	85, 590.0

Average movement of the wind at stations of the Signal Service, United States Army, for each month and the year, &amp;c.—Continued.

Stations:	Established.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
<b>Eastern Gulf States:</b>														
Atlanta, Ga.....	Sept. 25, 1878	7,843.8	7,658.2	8,340.3	6,600.7	5,967.3	5,442.8	5,470.7	5,237.8	5,540.8	6,477.0	6,705.7	7,387.5	78,732.7
Pensacola, Fla.....	Oct. 27, 1879	5,386.0	5,656.0	6,232.2	6,414.6	6,291.4	6,429.6	6,074.4	5,046.4	4,813.4	5,647.0	5,337.2	5,515.9	67,474.8
Mobile, Ala.....	Nov. 7, 1870	4,556.2	4,481.8	5,165.3	4,974.3	4,675.5	4,104.2	2,989.2	2,781.5	3,183.7	4,061.7	4,333.5	4,367.2	53,362.0
Montgomery, Ala.....	Nov. 9, 1870	4,059.4	4,195.0	4,851.9	4,217.1	3,642.6	3,381.5	3,188.3	2,863.6	3,116.0	3,543.6	3,660.5	3,923.0	46,072.1
Vicksburg, Miss.....	Sept. 10, 1871	4,496.4	4,408.3	4,968.3	4,805.2	5,152.2	4,328.0	3,071.3	2,851.3	3,843.3	3,586.1	4,706.7	4,794.9	47,596.9
New Orleans, La.....	Nov. 1, 1870	5,862.5	5,808.9	6,360.8	5,967.8	5,152.2	4,328.0	4,287.7	4,067.6	5,078.1	5,442.2	5,718.0	6,066.1	64,606.1
<b>Western Gulf States:</b>														
Shreveport, La.....	Sept. 3, 1871	3,818.5	4,013.0	4,712.8	4,684.7	3,890.9	3,248.2	3,127.9	2,752.6	2,923.8	3,142.4	3,490.0	3,756.2	43,520.6
Port Smith, Ark.....	June 1, 1882	4,459.0	4,318.5	4,933.0	4,637.5	4,060.0	2,768.3	2,841.3	2,688.7	2,865.7	3,237.0	3,332.0	3,416.0	43,962.0
Little Rock, Ark.....	July 1, 1879	4,081.4	4,190.8	5,053.8	4,714.4	3,862.2	3,119.4	3,294.5	2,829.5	3,715.8	3,558.0	3,883.0	4,130.5	45,042.0
Gastrop, Tex.....	Apr. 19, 1871	7,778.8	7,269.0	7,576.2	7,918.5	7,311.2	6,078.5	5,800.6	5,283.1	6,481.2	7,076.9	7,909.1	7,835.1	86,334.7
Indianola, Tex.....	May 1, 1872	10,423.8	9,985.5	10,651.2	11,824.2	9,722.5	8,286.7	8,063.5	7,075.5	7,949.5	8,727.5	10,132.3	10,423.1	112,673.5
Palestine, Tex.....	Dec. 3, 1881	6,319.0	7,684.0	7,815.5	7,411.3	6,745.7	4,917.7	6,052.3	5,034.7	5,551.7	6,328.3	6,962.8	7,157.0	76,972.0
<b>Rio Grande Valley:</b>														
Brownsville, Tex.....	Aug. 25, 1875	5,405.4	5,928.9	6,328.4	6,604.9	5,771.2	5,141.0	5,392.0	3,896.1	3,338.5	3,864.0	4,012.1	5,362.5	61,869.0
Rio Grande City, Tex.....	May 28, 1875	5,262.6	5,450.8	5,741.3	6,722.8	7,160.0	6,981.4	7,917.0	5,439.7	4,874.7	4,524.2	4,531.0	4,262.8	70,065.2
<b>Ohio Valley &amp; Tennessee:</b>														
Chattanooga, Tenn.....	Jan. 8, 1879	4,532.2	5,184.3	5,767.0	5,163.2	4,063.7	3,632.7	3,511.5	3,305.7	3,194.7	3,532.5	3,923.3	4,662.2	50,492.8
Knoxville, Tenn.....	Jan. 1, 1871	4,493.2	4,619.6	5,636.3	5,112.1	4,336.7	3,803.9	3,508.6	3,153.9	3,179.9	3,245.8	3,767.2	4,283.7	49,124.5
Memphis, Tenn.....	Feb. 28, 1871	4,503.2	4,019.2	4,948.5	4,828.8	3,650.4	3,463.5	3,301.2	3,005.3	3,209.8	3,028.5	3,294.6	4,411.3	47,451.5
Nashville, Tenn.....	Nov. 1, 1870	3,452.3	3,461.5	4,135.4	3,828.4	3,251.9	2,868.8	2,602.1	2,433.4	2,548.6	2,917.0	3,284.6	3,532.7	39,238.7
Louisville, Ky.....	Sept. 11, 1871	5,767.9	5,809.6	6,670.5	5,963.3	5,195.6	4,832.8	4,252.3	3,994.8	4,318.7	4,866.0	5,357.1	5,639.6	62,890.0
Indianapolis, Ind.....	Feb. 10, 1871	4,787.8	4,417.2	5,026.9	4,926.9	4,276.6	3,663.8	3,215.7	3,237.4	3,361.8	3,791.9	4,150.0	4,654.8	49,969.4
Cincinnati, Ohio.....	Nov. 1, 1870	4,710.6	4,603.9	5,530.1	4,818.8	4,305.2	3,863.8	3,562.5	3,194.2	3,454.0	3,888.4	4,301.2	4,575.8	51,084.1
Columbus, Ohio.....	July 1, 1878	6,018.3	6,234.3	6,963.0	6,163.2	5,255.5	4,963.8	4,562.5	3,737.9	3,219.9	3,888.4	4,631.6	5,065.1	63,945.3
Pittsburg, Pa.....	Nov. 1, 1870	5,075.4	4,642.8	5,601.3	4,782.0	4,125.3	3,863.8	3,708.0	3,278.6	3,563.6	4,031.5	4,796.9	5,150.9	53,921.2
<b>Lower Lakes:</b>														
Buffalo, N. Y.....	Nov. 1, 1870	8,515.5	7,332.3	7,747.9	6,248.1	5,906.5	5,132.3	5,415.2	4,935.8	5,890.5	6,854.5	7,321.3	8,028.6	80,964.5
Cayuga, N. Y.....	Nov. 1, 1870	7,945.8	7,401.8	7,677.2	6,308.5	5,632.0	4,592.7	4,701.6	4,432.9	5,325.4	6,490.8	7,631.4	8,683.1	76,152.1
Rochester, N. Y.....	Nov. 1, 1870	8,543.2	7,584.5	8,660.6	7,543.4	7,298.1	5,976.8	5,701.6	5,233.4	6,095.4	6,798.3	7,534.9	8,034.8	82,437.4
Erie, Pa.....	Nov. 25, 1873	7,718.2	7,823.9	8,354.6	7,604.7	6,012.2	5,564.5	5,478.2	5,290.9	6,399.3	7,067.0	9,008.0	9,575.3	93,595.8
Cleveland, Ohio.....	Nov. 1, 1870	8,038.5	8,953.3	9,953.5	6,945.1	6,234.9	5,645.2	5,454.5	5,128.2	6,271.2	7,267.9	8,114.5	8,518.5	83,788.8
Sandusky, Ohio.....	Aug. 2, 1877	9,643.8	9,438.9	10,263.8	10,253.8	9,467.2	8,590.0	7,604.6	7,003.3	8,428.6	9,652.4	10,414.6	10,991.8	111,817.8
Toledo, Ohio.....	Nov. 1, 1870	7,008.6	6,147.6	6,811.8	6,811.8	6,319.2	5,567.6	5,046.6	4,581.6	5,314.8	6,277.1	6,612.2	6,929.8	75,062.0
Detroit, Mich.....	Nov. 1, 1870	6,260.9	5,867.7	6,723.3	6,168.7	5,943.5	4,976.1	4,863.8	4,624.4	4,968.3	5,882.9	6,094.4	6,420.9	68,818.8
<b>Upper Lakes:</b>														
Superior, Mich.....	Sept. 10, 1872	6,899.8	6,949.2	7,621.1	6,717.6	6,232.7	5,066.1	5,592.8	5,303.8	6,046.8	6,755.3	6,908.0	6,967.5	79,043.0
Sault Ste. Marie, Mich.....	May 24, 1871	7,023.2	6,065.9	7,238.3	7,238.3	6,695.2	5,097.9	5,091.2	4,794.9	7,826.9	7,626.9	7,072.7	7,199.1	83,880.7
Grand Haven, Mich.....	May 24, 1871	8,601.2	8,276.5	8,981.2	8,448.5	7,876.7	6,447.3	6,275.3	6,067.7	8,177.2	8,902.2	8,539.2	8,024.2	95,636.7
Marquette City, Mich.....	Aug. 20, 1882	8,460.5	7,616.5	6,768.5	6,819.0	6,971.0	5,429.3	6,208.5	5,163.0	6,774.7	8,177.7	8,550.0	8,969.7	89,266.0

Marquette, Mich.	May 21, 1871	5,072.8	6,081.6	5,088.7	5,425.3	4,982.1	5,092.3	5,241.2	6,102.8	6,921.1	6,816.7	7,202.7	73,755.7
Port Huron, Mich.	July 24, 1871	7,672.4	7,219.5	7,718.5	7,434.6	5,910.0	5,277.7	5,404.5	6,032.4	7,082.3	7,470.2	7,788.5	81,416.6
Chicago, Ill.	Nov. 1, 1870	6,672.8	6,115.9	6,817.5	7,378.6	5,490.2	5,229.4	5,136.3	6,065.9	6,137.6	6,137.6	6,361.2	71,014.7
Milwaukee, Wis.	Nov. 1, 1870	5,814.2	5,236.9	5,662.5	7,878.6	4,751.3	5,012.3	6,685.5	7,218.9	5,440.9	6,601.2	9,177.5	81,839.0
Duluth, Minn.	Nov. 1, 1870	4,900.2	5,268.3	5,932.0	5,260.6	4,457.3	5,019.3	4,882.7	5,458.9	5,945.6	5,350.1	5,250.1	64,836.8
Upper Mississippi Valley:													
Saint Paul, Minn.	Nov. 1, 1870	5,704.4	5,461.3	5,955.7	7,012.5	6,118.8	5,326.8	5,314.5	5,913.5	6,528.8	5,750.4	5,972.2	72,533.6
La Crosse, Wis.	Oct. 15, 1871	5,144.2	4,267.3	5,256.0	5,829.3	5,137.8	4,955.2	4,586.0	5,052.3	5,832.9	5,456.3	5,147.3	64,573.0
Davenport, Iowa	May 24, 1871	6,902.9	6,104.7	7,595.4	6,768.5	5,507.8	4,947.3	4,794.2	5,650.0	6,018.8	5,223.6	5,142.9	72,890.5
Des Moines, Iowa	Aug. 1, 1873	4,815.3	5,044.7	5,093.2	4,902.0	4,218.8	3,713.0	3,464.5	4,000.3	4,871.5	4,648.7	4,710.0	53,930.5
Dubuque, Iowa	July 10, 1873	3,616.1	5,789.6	5,068.6	4,408.8	3,824.3	3,145.9	3,155.9	3,469.2	3,897.5	3,704.7	3,562.4	44,037.5
Keokuk, Iowa	June 10, 1871	5,013.8	5,676.1	7,000.9	6,437.3	5,256.2	4,625.7	4,688.4	5,415.9	5,811.6	5,949.0	5,943.8	60,801.6
Keokuk, Iowa	June 10, 1871	5,013.8	5,676.1	7,000.9	6,437.3	5,256.2	4,625.7	4,688.4	5,415.9	5,811.6	5,949.0	5,943.8	60,801.6
Chicago, Ill.	July 1, 1871	5,808.2	5,840.6	6,157.8	6,472.5	4,903.3	3,919.0	3,688.4	4,155.9	5,833.8	5,639.0	5,906.1	64,500.6
Springfield, Ill.	July 1, 1871	7,103.6	7,003.4	8,011.0	7,324.4	5,272.2	4,515.2	5,102.0	5,747.0	6,051.0	5,781.2	5,894.7	76,198.4
Saint Louis, Mo.	Nov. 1, 1870	7,834.9	7,144.8	7,873.8	7,376.0	6,423.4	5,815.3	5,596.4	6,234.6	7,075.7	7,725.7	7,725.7	86,188.4
Missouri Valley:													
Leavenworth, Kans.	May 21, 1871	5,372.7	5,231.5	6,655.4	5,651.9	4,968.8	4,032.0	3,919.4	4,571.2	4,888.3	5,206.6	5,947.8	62,357.3
Omaha, Nebr.	Nov. 1, 1870	6,897.9	6,490.5	7,864.9	6,923.4	5,740.0	5,214.3	5,065.4	5,949.5	6,438.3	6,880.6	6,596.7	77,587.9
Bennett, Fort, Dak.	Dec. 22, 1879	4,899.5	4,282.7	5,964.7	7,195.5	6,043.2	5,814.2	6,537.7	6,287.0	5,876.0	5,068.0	4,566.7	66,439.5
Huron, Dak.	July 1, 1881	3,073.0	7,294.3	8,140.0	8,376.0	6,704.3	5,246.0	6,987.2	7,702.5	7,614.5	7,210.2	6,964.0	80,137.3
Yankton, Dak.	April 1, 1873	5,495.1	6,411.4	7,869.5	7,898.8	6,782.1	5,246.0	5,268.5	5,953.2	6,897.3	6,397.3	6,031.1	70,507.0
Extreme Northwest:													
Moorhead, Minn.	Jan. 1, 1881	3,866.5	7,459.8	8,743.7	8,017.2	7,387.0	6,915.8	7,437.5	7,784.0	8,117.2	7,941.8	7,968.5	91,063.0
Saint Vincent, Minn.	Sept. 5, 1880	7,223.0	6,504.0	7,185.8	7,123.8	5,994.0	5,833.0	5,536.0	6,087.2	6,884.6	7,206.2	7,277.8	75,597.0
Bismarck, Dak.	Sept. 15, 1874	5,977.1	5,704.9	6,968.0	7,741.7	6,057.3	6,681.7	6,387.4	6,511.4	7,127.2	6,238.1	5,911.8	80,322.4
Buford, Fort, Dak.	Oct. 23, 1878	5,118.0	4,903.8	6,046.7	7,119.3	6,229.7	6,625.0	6,790.7	6,906.0	6,692.8	5,910.5	5,183.5	74,533.2
Northern Slope:													
Assinaboine, Fort, Mont.	Oct. 6, 1879	8,149.3	7,962.2	7,224.0	7,208.3	7,059.3	7,630.7	6,500.8	6,447.5	7,902.8	8,532.4	8,102.8	91,574.7
Bentley, Fort, Mont.	Oct. 11, 1879	4,405.2	5,384.5	5,904.5	5,675.2	5,017.0	5,037.5	4,335.4	4,862.8	5,454.4	5,935.2	5,508.0	84,500.5
Custer, Fort, Mont.	Dec. 5, 1878	4,962.5	4,876.0	5,239.5	5,162.2	4,324.5	5,189.8	5,122.8	4,787.2	5,115.8	4,038.2	4,611.2	63,359.0
Helena, Mont.	Oct. 15, 1879	3,450.2	3,982.0	4,624.2	4,740.6	4,064.5	4,738.5	4,160.6	3,959.2	4,796.3	3,568.8	3,416.8	50,987.2
Magnin's Fort, Mont.	July 14, 1882	1,942.5	3,193.0	7,053.0	7,044.0	7,312.0	7,389.5	6,997.0	6,538.7	8,846.7	7,760.7	9,300.0	94,191.5
Shaw, Fort, Mont.	April 1, 1880	4,481.8	6,481.8	7,645.5	7,734.5	5,943.3	6,565.0	6,920.0	5,965.2	7,384.8	7,951.0	8,297.8	83,143.0
Deadwood, Dak.	Dec. 23, 1877	3,980.1	3,497.3	3,839.7	3,153.7	3,254.0	3,161.0	3,165.5	2,953.2	3,205.2	2,518.4	2,719.1	35,412.6
Cheyenne, Wyo.	Nov. 1, 1870	9,613.6	8,417.7	9,295.3	7,704.8	6,640.9	8,016.6	8,041.2	6,427.6	8,427.1	7,947.8	8,297.1	102,860.1
North Platte, Nebr.	Sept. 18, 1874	7,240.3	6,678.5	8,498.9	10,201.0	9,000.54	8,896.3	8,354.9	8,399.9	8,421.0	7,163.6	6,650.7	100,188.1
Middle Slope:													
Denver, Colo.	Nov. 19, 1871	4,780.8	4,170.0	5,439.5	5,082.2	4,593.7	4,574.1	4,200.9	4,007.7	4,412.5	4,391.6	4,409.9	55,299.0
Pike's Peak, Colo.	Nov. 1, 1873	18,632.6	17,146.6	18,789.6	15,940.2	13,638.7	9,459.8	8,958.6	11,587.2	15,710.6	14,159.9	16,493.1	180,175.3
West Las Animas, Colo.													
Dodge City, Kans.	Oct. 1, 1881	5,959.5	5,990.0	7,149.0	7,441.3	6,217.0	5,549.0	5,995.7	6,490.7	6,214.7	5,453.3	5,197.0	73,848.5
Elliot, Fort, Tex.	Sept. 15, 1874	6,082.7	7,798.2	10,139.0	10,732.5	9,644.2	9,241.2	8,283.5	9,915.5	9,010.5	7,505.1	7,645.5	109,807.0
Southern Slope:	Nov. 20, 1879	8,200.4	7,879.2	9,443.2	10,398.0	8,631.0	7,434.0	6,116.4	7,239.4	8,098.0	7,155.0	7,463.7	100,120.7
Sill, Fort, Ind. T.	June 23, 1875	7,489.7	7,785.0	9,394.5	9,887.2	8,751.2	7,439.9	6,223.0	7,295.8	7,816.0	6,853.6	7,309.0	91,965.0
Concho, Fort, Tex.	Oct. 10, 1875	6,180.2	6,341.7	7,263.3	6,993.3	7,140.6	6,538.4	5,891.1	6,098.6	6,411.7	5,698.3	6,411.7	80,849.5
Davis, Fort, Tex.	Dec. 24, 1877	4,144.7	5,920.2	4,997.7	4,122.4	3,837.4	3,589.1	3,413.8	3,154.8	3,809.3	3,945.2	4,604.2	48,213.0
Stockton, Fort, Tex.	Feb. 26, 1876	6,331.7	5,592.6	7,178.0	6,101.3	5,801.1	5,086.0	7,071.6	7,661.5	6,722.9	5,105.1	5,120.4	81,390.4
Southern Plateau:													
Santa Fe, N. Mex.	Nov. 20, 1871	5,158.6	4,782.5	6,000.3	6,320.2	5,385.8	4,961.1	4,567.2	4,231.1	4,922.4	4,693.2	4,670.2	60,709.4
El Paso, Tex.	Nov. 5, 1877	5,538.7	4,966.5	4,623.3	4,322.3	3,742.8	3,436.4	2,535.6	2,607.6	3,007.3	3,164.7	3,462.1	43,440.2

Average movement of the wind at stations of the Signal Service, United States Army, for each month and the year, &amp;c.—Continued.

Stations.	Established.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
<b>South'n Plateau—Cont'd.</b>														
Apache, Fort, Ariz.	Oct. 9, 1877	3, 762.5	3, 944.5	5, 017.2	5, 792.5	5, 775.3	5, 537.7	4, 561.3	3, 552.5	4, 042.8	4, 346.2	3, 317.3	3, 587.6	56, 292.8
Prescott, Ariz.	Nov. 1, 1875	3, 701.2	5, 091.2	5, 546.0	6, 377.3	5, 535.5	6, 629.8	4, 963.3	4, 446.5	5, 164.0	5, 820.0	4, 900.0	4, 923.2	62, 945.4
Yuma, Ariz.	Nov. 19, 1873	4, 216.0	4, 212.8	5, 337.7	6, 162.7	5, 906.7	5, 293.3	4, 349.6	3, 574.0	3, 813.2	4, 227.2	3, 300.2	3, 802.2	55, 259.2
Middle Plateau:	Nov. 18, 1873	4, 216.0	4, 784.0	4, 370.6	4, 476.4	4, 274.7	3, 615.6	4, 423.5	4, 067.5	3, 963.0	3, 315.1	3, 597.0	3, 678.4	47, 641.8
Winnemucca, Nev.	July 1, 1877	6, 854.7	6, 407.5	7, 162.2	6, 390.8	4, 464.3	6, 009.8	7, 212.8	6, 008.5	6, 141.5	6, 331.8	5, 658.7	6, 450.3	75, 916.0
Salt Lake City, Utah	Mar. 10, 1874	2, 936.5	2, 955.7	4, 368.7	4, 596.0	4, 321.4	4, 440.3	4, 250.2	4, 210.5	3, 945.2	3, 670.2	2, 906.2	2, 591.3	46, 365.7
<b>Northern Plateau:</b>														
Boise City, Idaho	July 1, 1877	3, 189.7	3, 309.0	4, 180.4	4, 273.9	4, 376.1	3, 547.4	3, 310.0	2, 827.5	2, 746.0	3, 003.5	2, 528.4	2, 563.5	40, 216.0
Lewiston, Idaho	July 1, 1879	2, 532.4	2, 117.5	2, 498.8	2, 356.0	2, 412.8	2, 094.0	2, 356.6	2, 080.6	1, 696.4	1, 530.8	1, 536.4	2, 155.0	24, 022.0
Dayton, Wash.	July 1, 1870	3, 392.2	3, 610.8	4, 274.2	4, 532.5	4, 142.8	3, 004.0	3, 883.2	3, 078.8	3, 670.0	4, 205.2	3, 513.5	3, 501.4	43, 224.0
Spokane Falls, Wash.	Feb. 5, 1881	2, 760.3	3, 038.8	3, 465.8	4, 407.2	4, 063.8	4, 008.8	3, 907.8	3, 328.2	2, 917.5	3, 180.8	2, 491.0	2, 731.5	38, 934.0
<b>North Pacific Coast:</b>														
Cambay, Fort, Wash.	Sept. 1, 1883	11, 562.0	7, 714.0	5, 710.0	7, 120.0	6, 717.0	6, 574.0	4, 230.0	5, 503.0	6, 909.5	8, 087.5	8, 903.5	9, 640.5	99, 779.0
Olympia, Wash.	July 1, 1877	8, 080.3	2, 962.9	3, 020.6	2, 980.0	2, 597.0	2, 590.6	2, 601.5	2, 603.8	2, 228.8	2, 082.2	2, 012.2	3, 110.4	32, 532.3
Tatoosh Island, Wash.	Oct. 1, 1883	12, 136.0	11, 705.0	8, 339.0	7, 444.0	8, 138.0	5, 672.0	8, 790.0	6, 015.0	6, 351.0	9, 202.5	12, 475.0	12, 404.0	105, 408.0
Portland, Oreg.	July 1, 1871	4, 393.7	3, 531.4	3, 781.1	3, 432.5	3, 607.4	3, 882.7	3, 508.1	3, 050.6	3, 025.1	3, 031.0	2, 181.2	3, 407.8	40, 873.9
Roseburg, Oreg.	July 15, 1877	2, 292.1	2, 065.6	2, 379.0	2, 538.7	2, 562.6	2, 619.0	2, 613.4	2, 446.5	1, 988.2	1, 868.0	1, 453.6	1, 797.1	27, 258.5
<b>Middle Pacific Coast:</b>														
Cape Mendocino, Cal.	July 27, 1882	11, 678.5	12, 129.0	10, 006.0	15, 133.0	12, 907.0	12, 665.0	16, 385.0	14, 945.0	11, 887.0	11, 763.0	11, 542.7	11, 542.7	.....
Red Bluff, Cal.	July 1, 1877	5, 018.7	5, 018.7	6, 471.7	6, 050.9	6, 037.0	5, 492.6	4, 481.0	3, 740.3	4, 483.6	4, 887.2	4, 041.9	5, 002.1	60, 636.6
Sacramento, Cal.	July 1, 1877	4, 554.1	5, 433.9	5, 469.1	5, 469.1	5, 515.7	5, 541.3	5, 104.5	4, 497.2	4, 071.5	3, 846.6	3, 273.9	4, 565.2	57, 051.4
San Francisco, Cal.	Mar. 8, 1871	5, 263.2	4, 909.9	6, 624.0	7, 189.9	6, 399.6	6, 080.5	6, 495.8	6, 962.9	7, 134.5	5, 782.6	4, 597.4	4, 941.9	82, 091.6
<b>South Pacific Coast:</b>														
Los Angeles, Cal.	July 1, 1877	4, 276.4	4, 068.3	4, 101.7	3, 950.4	4, 038.1	3, 715.7	3, 902.2	3, 401.4	3, 368.1	3, 531.1	3, 598.4	3, 825.1	45, 290.3
San Diego, Cal.	Nov. 1, 1871	3, 566.5	4, 157.4	4, 886.7	4, 863.8	4, 954.8	4, 583.7	4, 726.3	4, 517.3	4, 898.2	4, 066.5	3, 615.1	3, 880.8	52, 823.9
<b>Alaska Stations:</b>														
Saint Michael's, Fort,	June 28, 1874	10, 310.2	8, 722.2	9, 576.4	8, 559.0	7, 431.0	7, 505.4	8, 331.3	9, 094.8	9, 955.9	10, 530.0	9, 992.2	9, 903.3	106, 230.8
Sitka, Alaska	Mar. 30, 1881	7, 493.7	6, 432.5	7, 050.7	6, 295.2	6, 475.8	4, 084.5	5, 428.5	4, 624.0	5, 470.8	6, 650.0	8, 696.0	9, 180.2	79, 685.7
Unalaska, Alaska	Aug. 16, 1878	9, 247.0	10, 860.0	9, 963.0	9, 268.6	8, 268.0	7, 894.3	7, 276.3	6, 515.0	6, 684.3	6, 700.5	5, 941.4	10, 174.8	106, 561.7
Deering's Island,	May 22, 1882	11, 906.5	11, 379.5	10, 827.5	9, 384.0	8, 970.5	7, 891.0	7, 200.0	6, 969.3	7, 392.8	11, 502.7	9, 921.0	9, 896.7	111, 170.5
Bering Sea														



## APPENDIX 47.

*Average hourly velocity of the wind, in miles, at stations of the Signal Service, United States Army, for each month and the year. (Computed from the commencement of observations at each, to and including December, 1884.)*

[The average hourly velocity is obtained by dividing the average monthly movement by twenty-four times the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
<b>New England:</b>													
Eastport, Me.....	12.4	12.5	12.8	10.1	8.3	6.7	6.3	5.7	7.4	9.6	11.8	11.8	9.6
Portland, Me.....	7.7	6.4	9.1	8.8	7.8	6.9	6.6	5.8	6.7	7.4	8.3	7.9	7.6
Boston, Mass.....	9.9	10.6	11.3	10.1	8.8	7.8	7.4	7.1	8.2	9.0	10.3	10.0	9.2
Block Island, R. I.....	17.6	16.5	17.3	14.0	14.0	12.2	11.6	10.3	13.7	15.1	16.6	17.5	14.8
New Haven, Conn.....	8.0	8.3	9.4	9.0	7.4	6.4	6.1	5.8	6.8	7.4	8.1	7.9	7.6
New London, Conn.....	7.7	8.6	9.1	8.4	7.1	6.1	5.7	5.3	6.1	7.1	8.0	7.6	7.2
<b>Middle Atlantic States:</b>													
Albany, N. Y.....	7.8	8.3	8.8	8.4	7.0	5.9	5.2	4.5	5.0	6.1	7.2	7.3	6.8
New York City.....	9.9	10.9	11.6	10.0	8.8	8.0	7.7	7.5	8.7	9.4	10.1	10.2	9.4
Philadelphia, Pa.....	10.2	10.8	11.8	11.1	9.7	9.0	8.4	7.6	8.3	9.3	9.7	10.1	9.7
Atlantic City, N. J.....	9.8	10.7	11.7	11.4	9.9	8.8	7.0	8.9	10.1	9.5	9.6	9.6	9.6
Barnegat City, N. J.....	14.9	14.0	15.2	18.7	12.0	10.9	9.9	10.7	12.4	12.7	13.6	13.3	12.8
Cape May, N. J.....	14.6	16.3	16.5	14.8	12.6	11.0	10.2	9.8	11.8	18.7	15.8	10.0	13.6
Sandy Hook, N. J.....	15.1	14.7	16.6	14.5	12.4	11.9	11.1	11.2	13.7	14.9	16.4	16.9	14.1
Delaware Breakwater, Del.....	16.8	18.1	19.3	16.9	15.5	13.8	12.1	12.2	15.2	16.9	17.0	17.1	15.8
Baltimore, Md.....	8.6	6.1	7.0	6.9	6.0	5.9	5.0	4.9	5.8	6.4	5.5	5.7	5.5
Washington City.....	8.3	7.1	8.5	8.0	6.5	5.9	5.4	4.8	5.3	6.4	6.1	6.5	6.3
Cape Henry, Va.....	12.9	13.5	14.6	13.7	11.7	11.1	9.8	9.8	12.5	13.6	13.6	13.5	12.5
Chincoteague, Va.....	12.3	13.1	14.4	13.9	12.4	10.7	9.6	9.8	11.1	12.4	12.9	11.7	12.0
Lynchburg, Va.....	8.7	4.4	5.1	4.7	3.9	3.2	3.1	2.8	2.6	2.9	3.2	3.7	3.6
Norfolk, Va.....	7.5	8.6	9.3	8.7	7.8	7.3	6.7	6.4	6.6	7.2	7.6	7.6	7.0
<b>South Atlantic States:</b>													
Charlotte, N. C.....	5.2	6.4	6.6	6.2	5.2	5.2	4.0	4.5	4.8	4.9	5.0	5.1	5.3
Hatteras, N. C.....	14.9	16.3	16.9	10.7	14.7	14.6	13.7	13.2	13.3	13.6	12.9	13.9	14.6
Kitty Hawk, N. C.....	15.2	16.0	15.9	10.0	14.6	13.7	12.2	12.4	14.8	15.1	16.1	15.5	14.8
Macon, Fort, N. C.....	12.7	13.7	14.4	13.4	12.5	12.4	11.3	11.0	12.9	13.4	12.0	12.8	12.8
Smithville, N. C.....	8.6	9.8	10.9	10.7	9.9	10.8	10.6	9.1	9.2	8.5	8.4	8.7	9.0
Wilmington, N. C.....	7.2	7.8	9.1	8.7	7.2	7.6	6.0	5.7	5.9	6.1	6.7	7.1	7.1
Charleston, S. C.....	7.4	8.1	8.8	8.0	8.7	8.2	7.6	7.2	7.8	7.7	7.4	7.1	7.9
Augusta, Ga.....	3.5	4.3	4.9	4.4	4.0	3.9	3.3	3.1	3.4	3.6	3.6	3.3	3.8
Savannah, Ga.....	6.3	7.1	7.9	7.5	7.4	6.3	5.8	5.4	5.7	6.1	6.3	6.2	6.5
Jacksonville, Fla.....	5.7	6.8	7.9	7.0	6.7	6.9	6.4	6.1	6.4	6.9	6.4	6.0	6.6
<b>Florida Peninsula:</b>													
Cedar Keys, Fla.....	9.0	9.5	11.1	10.4	9.7	9.3	8.4	8.6	8.3	9.2	7.9	8.4	9.2
Key West, Fla.....	10.9	10.3	11.2	10.6	9.4	7.7	7.5	7.8	8.2	11.8	11.2	11.1	9.8
Sanford, Fla.....	7.8	6.7	7.3	6.9	5.9	5.6	4.7	4.9	6.4	6.8	8.5	5.0	6.4
<b>Eastern Gulf States:</b>													
Atlanta, Ga.....	10.5	11.3	11.2	9.2	8.0	7.6	7.4	7.1	7.7	8.7	9.3	9.9	9.0
Pensacola, Fla.....	7.2	8.3	8.6	8.9	8.4	8.1	6.8	6.8	6.7	7.6	7.4	7.4	7.7
Mobile, Ala.....	6.1	6.6	6.9	6.9	6.3	5.7	5.4	5.1	5.7	6.0	6.0	5.9	6.0
Montgomery, Ala.....	5.5	6.2	6.5	6.9	4.9	4.7	4.2	3.9	4.5	4.8	5.1	5.0	5.1
Vicksburg, Miss.....	6.0	6.5	6.9	6.7	5.2	4.5	4.1	3.8	3.9	4.8	6.1	6.3	5.4
New Orleans, La.....	7.9	8.6	8.5	8.3	6.9	6.0	5.8	5.5	7.1	7.3	7.9	8.1	7.3
<b>Western Gulf States:</b>													
Shreveport, La.....	5.1	5.9	6.3	6.4	5.2	4.5	4.2	3.7	4.1	4.2	4.9	5.0	5.0
Fort Smith, Ark.....	6.0	6.3	6.6	6.4	5.5	3.9	3.8	3.6	4.0	4.4	4.6	5.8	5.1
Little Rock, Ark.....	5.5	6.2	6.8	6.5	5.2	4.3	4.4	3.8	3.8	4.8	5.3	5.6	5.2
Galveston, Tex.....	10.5	10.7	10.2	11.0	9.8	8.4	7.8	7.1	9.0	0.5	10.0	10.5	9.6
Indianola, Tex.....	14.0	14.7	14.3	16.4	13.1	11.4	10.4	9.5	11.1	11.7	14.1	14.0	12.9
Palestine, Tex.....	8.5	11.2	10.5	10.3	9.1	6.8	6.1	6.8	7.7	8.5	8.8	9.6	8.8
San Antonio, Tex.....	4.8	5.6	4.9	4.9	4.8	4.8	4.6	3.8	4.2	4.2	4.9	4.8	4.7
<b>Rio Grande Valley:</b>													
Brownsville, Tex.....	7.3	8.7	8.5	9.2	7.8	7.1	7.2	5.2	4.6	5.2	6.8	7.2	7.1
Rio Grande City, Tex.....	7.1	8.0	7.7	9.3	9.0	9.6	10.6	7.3	6.8	6.1	6.8	8.8	7.8
<b>Ohio Valley and Tennessee:</b>													
Chattanooga, Tenn.....	6.1	7.6	7.8	7.3	5.5	5.0	4.7	4.4	4.4	4.7	5.4	6.3	5.8
Knoxville, Tenn.....	6.0	6.8	7.6	7.1	5.8	5.3	4.7	4.2	4.4	4.4	5.3	5.8	5.6
Memphis, Tenn.....	6.1	5.9	6.7	6.7	4.9	4.8	4.4	4.0	4.5	4.9	5.8	5.9	5.4
Nashville, Tenn.....	4.6	5.1	5.5	5.3	4.4	4.0	3.5	3.3	3.5	3.9	4.0	4.7	4.4
Louisville, Ky.....	7.8	8.6	9.0	8.3	7.0	6.7	5.7	5.4	6.0	6.5	7.4	7.6	7.0

*Average hourly velocity of the wind, in miles, &c.—Continued.*

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
<b>Ohio Valley and Tennessee—</b>													
<b>Continued:</b>													
Indianapolis, Ind.....	6.4	6.5	7.4	7.0	5.7	5.1	4.3	4.5	4.7	5.1	5.8	6.2	5.7
Cincinnati, Ohio.....	6.3	6.8	7.4	6.7	5.8	5.5	4.8	4.3	4.8	5.2	6.0	6.2	5.8
Columbus, Ohio.....	8.1	9.2	9.4	8.6	7.1	6.7	5.0	5.0	5.9	6.3	7.8	8.2	7.3
Pittsburg, Pa.....	6.8	6.8	7.5	6.6	5.5	5.5	5.1	4.4	4.9	5.4	6.7	6.9	6.0
<b>Lower Lakes:</b>													
Buffalo, N. Y.....	11.5	10.8	10.4	8.7	7.9	7.2	7.3	6.6	8.1	9.2	11.0	12.1	9.2
Oswego, N. Y.....	10.7	10.9	10.3	8.8	7.6	6.4	6.3	6.0	7.4	8.7	10.6	10.9	8.7
Rochester, N. Y.....	11.5	11.6	11.7	10.5	9.8	8.3	7.7	7.0	8.3	9.1	10.5	10.8	9.7
Erie, Pa.....	11.7	11.7	11.2	10.7	8.9	8.3	7.4	7.1	8.8	10.3	12.5	12.9	10.1
Cleveland, Ohio.....	10.8	10.3	10.7	9.2	8.4	7.8	7.3	6.9	8.7	9.8	11.9	11.1	9.4
Sandusky, Ohio.....	13.0	13.9	14.7	14.2	12.7	11.9	10.3	10.2	11.7	13.0	14.5	13.4	12.8
Toledo, Ohio.....	9.4	9.1	8.7	8.5	8.5	7.7	6.8	6.6	7.4	8.4	9.2	9.3	8.5
Detroit, Mich.....	8.4	8.7	9.0	8.6	8.0	6.9	6.5	6.2	6.9	7.9	8.5	8.6	7.8
<b>Upper Lakes:</b>													
Alpena, Mich.....	9.3	10.1	10.2	9.3	8.4	7.9	7.5	7.1	8.4	9.1	9.6	9.4	8.9
Escanaba, Mich.....	9.4	9.8	10.4	10.1	9.0	8.5	8.0	7.7	9.7	10.5	9.8	9.7	9.4
Grand Haven, Mich.....	11.7	12.2	12.0	11.7	10.6	9.0	8.4	8.2	10.0	11.8	12.3	12.1	10.8
MacKinnaw City, Mich.....	11.4	10.3	9.1	8.5	9.4	7.7	8.5	8.3	9.4	11.0	11.9	11.9	8.8
Marquette, Mich.....	9.4	8.9	8.2	8.3	7.3	6.9	6.8	7.0	8.6	9.3	9.5	9.7	8.4
Port Huron, Mich.....	10.3	10.7	10.7	10.7	10.0	8.3	7.8	7.3	8.4	9.5	10.4	10.5	9.6
Chicago, Ill.....	9.0	9.0	8.7	9.5	8.6	7.6	7.0	6.9	7.8	8.9	8.5	8.6	8.4
Milwaukee, Wis.....	10.5	12.3	12.9	11.9	10.6	9.8	8.5	8.9	10.0	11.3	11.9	12.8	10.9
Duluth, Minn.....	6.6	7.7	7.9	8.8	7.0	6.2	6.7	6.6	7.6	8.0	7.4	7.1	7.3
<b>Upper Mississippi Valley:</b>													
Saint Paul, Minn.....	7.7	8.1	8.8	9.7	9.4	8.4	7.2	7.4	8.2	8.8	8.0	7.5	8.3
La Crosse, Wis.....	6.9	7.8	8.4	8.7	7.8	7.1	6.3	6.2	7.0	7.8	7.6	6.9	7.4
Davenport, Iowa.....	8.5	9.0	10.3	10.5	9.1	7.6	6.9	6.4	7.7	8.1	8.6	8.3	8.4
Des Moines, Iowa.....	6.5	7.4	8.0	8.3	6.6	5.9	5.0	4.7	5.6	5.9	6.5	6.3	6.4
Dubuque, Iowa.....	4.9	5.6	6.5	7.0	5.9	5.3	4.4	4.2	4.7	5.3	5.2	4.8	5.3
Keokuk, Iowa.....	8.1	8.4	9.5	10.1	8.7	7.3	6.2	6.3	7.5	7.8	8.8	7.6	8.0
Calro, Ill.....	7.8	8.6	10.0	9.0	7.5	6.5	5.3	4.9	5.8	6.6	7.8	7.8	7.2
Springfield, Ill.....	9.6	10.4	10.8	10.3	8.5	7.3	6.1	6.6	8.0	8.1	9.4	9.3	8.7
Saint Louis, Mo.....	10.5	10.5	11.8	10.9	9.8	8.9	7.8	7.5	8.7	9.5	10.7	10.4	9.8
<b>Missouri Valley:</b>													
Leavenworth, Kans.....	7.2	7.7	9.3	9.2	7.6	6.9	5.4	5.3	6.5	6.6	7.2	6.8	7.1
Omaha, Nebr.....	9.2	9.5	10.6	10.9	9.3	8.0	7.0	6.9	7.8	8.7	9.6	8.9	8.9
Bennett, Fort, Dak.....	6.4	6.3	8.0	9.6	9.7	8.4	7.8	8.9	8.7	7.9	7.0	6.2	7.9
Huron, Dak.....	10.9	10.7	11.3	12.4	11.3	9.3	9.5	9.4	10.7	10.2	10.0	9.4	10.4
Yankton, Dak.....	8.7	9.5	10.6	12.0	10.6	9.4	7.1	7.1	8.1	9.2	2.9	8.1	9.1
<b>Extreme Northwest:</b>													
Moorhead, Minn.....	11.2	11.0	11.8	11.1	11.7	10.3	9.3	10.0	10.8	10.9	11.0	10.8	10.8
Saint Vincent, Minn.....	9.7	9.6	9.7	8.8	9.6	8.8	7.8	7.4	8.5	9.3	10.1	9.7	9.0
Bismarck, Dak.....	8.0	8.5	9.4	11.3	10.4	9.2	9.0	8.6	9.0	9.6	8.7	7.9	9.1
Buford, Fort, Dak.....	6.9	7.2	8.1	10.3	9.6	8.7	8.9	9.0	8.8	9.0	8.2	7.0	8.5
<b>Northern Slope:</b>													
Assinaboine, Fort, Mont.....	11.0	11.8	9.7	10.4	9.7	9.8	10.3	8.7	9.0	10.5	11.9	11.0	10.3
Benton, Fort, Mont.....	7.8	7.9	7.5	7.9	7.2	7.0	6.8	5.8	6.8	7.3	8.2	7.5	7.3
Custer, Fort, Mont.....	6.7	7.2	7.8	8.6	8.0	6.9	7.0	6.9	6.6	6.9	6.4	6.6	7.1
Helena, Mont.....	4.6	5.0	6.2	6.6	6.7	6.5	6.3	5.6	5.5	5.4	5.0	4.6	5.7
Maginnis, Fort, Mont.....	15.2	12.0	9.5	10.4	10.3	10.2	9.9	9.4	9.5	11.9	13.6	12.5	11.2
Shaw, Fort, Mont.....	11.8	12.4	10.3	9.4	9.1	8.3	7.6	6.6	7.9	9.9	11.0	11.2	9.6
Deadwood, Dak.....	4.0	3.6	3.8	4.0	4.2	4.5	4.2	4.3	4.1	4.3	3.5	3.7	4.0
Cheyenne, Wyo.....	12.9	12.4	12.5	11.8	10.5	9.2	8.9	8.1	8.9	10.0	11.0	11.2	10.6
North Platte, Nebr.....	9.8	9.9	12.2	13.4	13.7	12.6	11.8	11.2	11.5	11.3	9.9	8.9	11.4
<b>Middle Slope:</b>													
Denver, Colo.....	6.4	6.2	7.3	7.3	6.8	6.4	6.1	5.6	5.6	5.9	6.1	5.9	6.3
Pike's Peak, Colo.....	25.0	25.9	25.3	21.3	21.5	19.0	12.7	12.0	16.1	21.1	19.7	22.2	20.1
West Las Animas, Colo.....	8.0	8.8	9.6	11.7	11.3	8.0	7.5	7.9	8.9	8.4	6.2	6.9	8.6
Dodge City, Kans.....	10.9	11.5	14.0	14.9	14.5	13.3	12.6	11.1	12.4	12.0	10.4	10.3	12.3
Elliott, Fort, Tex.....	11.0	11.6	12.4	14.4	13.5	12.0	10.0	8.2	10.1	10.9	9.9	10.1	11.3
<b>Southern Slope:</b>													
Sill, Fort, Ind. T.....	10.0	11.5	12.5	13.7	13.1	12.2	10.0	8.4	10.1	10.5	9.5	9.8	10.9
Concho, Fort, Tex.....	8.3	9.4	9.8	11.1	11.1	9.9	8.9	7.3	7.8	8.0	7.9	8.7	9.0
Davis, Fort, Tex.....	5.6	5.8	6.7	7.1	5.8	5.4	4.8	4.6	4.4	5.1	5.5	6.3	5.6
Stockton, Fort, Tex.....	8.5	8.2	9.6	10.7	12.2	12.4	10.9	9.5	10.6	9.0	7.1	6.9	9.6
<b>Southern Plateau:</b>													
Santa Fé, N. Mex.....	6.9	7.1	8.1	8.8	8.5	7.5	6.7	6.1	5.9	6.6	6.5	6.3	7.1
El Paso, Tex.....	4.7	5.9	6.5	6.4	5.8	5.2	4.6	3.4	3.6	4.0	4.4	4.7	4.9
Apache, Fort, Ariz.....	5.1	5.8	6.7	8.0	7.8	7.7	6.1	5.2	5.0	5.5	5.3	5.2	6.2
Grant, Fort, Ariz.....	6.4	7.5	7.5	8.9	7.8	7.8	6.7	6.0	7.1	7.2	6.8	6.6	7.2
Prescott, Ariz.....	5.0	6.2	7.2	8.6	7.9	7.4	5.8	4.8	5.3	5.7	4.6	5.1	6.1
Yuma, Ariz.....	5.7	7.0	5.9	6.2	5.7	5.0	5.9	5.5	4.1	4.5	5.0	4.9	5.4
<b>Middle Plateau:</b>													
Winnemucca, Nev.....	9.2	9.5	9.6	8.9	8.7	9.2	9.7	8.9	8.5	8.5	7.9	8.7	8.9
Salt Lake City, Utah.....	4.0	4.4	5.9	6.4	6.5	6.2	5.7	5.7	5.5	4.9	3.9	3.9	5.2

*Average hourly velocity of the wind, in miles, &c.—Continued.*

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
<b>Northern Plateau:</b>													
Boisé City, Idaho .....	4.3	4.9	5.6	5.9	5.9	4.9	4.4	3.8	3.8	4.0	3.5	3.5	4.5
Lewiston, Idaho .....	3.4	3.1	3.4	3.3	3.3	2.9	3.2	2.7	2.2	2.1	2.9	2.9	2.9
Dayton, Wash .....	4.9	5.4	5.7	6.3	5.9	5.4	5.2	4.9	4.9	5.7	4.9	4.8	5.3
Spokane Falls, Wash .....	3.7	4.5	4.7	6.1	5.5	5.6	5.3	4.5	4.1	4.5	3.5	3.7	4.6
<b>North Pacific Coast:</b>													
Canby, Fort, Wash .....	15.5	11.1	7.7	9.9	9.0	9.1	5.7	7.4	9.6	10.9	11.9	12.0	10.1
Olympia, Wash .....	4.1	4.4	4.1	4.1	3.9	3.6	3.5	2.8	3.1	3.8	3.6	4.2	3.8
Tatoosh Island, Wash .....	16.3	17.3	11.2	10.3	10.9	7.9	5.1	8.1	3.8	12.4	17.9	16.7	11.9
Portland, Oreg .....	5.9	5.2	5.1	4.8	4.8	4.7	4.7	4.1	4.3	4.1	4.4	4.7	4.7
Roseburg, Oreg .....	3.6	3.1	3.2	3.5	3.4	3.6	3.5	3.3	2.8	2.5	2.6	2.4	3.0
<b>Middle Pacific Coast:</b>													
Cape Mendocino, Cal .....	15.6	18.0	14.3	21.0	16.9	17.6	22.0	19.7	16.5	15.8	16.4	15.5	17.4
Red Bluff, Cal .....	7.6	8.3	8.7	8.4	8.1	7.6	6.0	5.1	6.2	6.6	5.6	6.7	7.1
Sacramento, Cal .....	6.4	6.9	7.3	7.6	7.4	7.6	6.9	6.0	5.7	5.2	4.6	4.1	6.3
San Francisco, Cal .....	7.1	7.3	8.9	10.0	11.2	12.5	12.8	12.0	9.9	7.7	6.1	6.6	9.3
<b>South Pacific Coast:</b>													
Los Angeles, Cal .....	5.7	6.0	5.5	5.5	5.4	5.2	4.8	4.6	4.7	4.8	4.9	5.1	5.2
San Diego, Cal .....	5.2	6.1	6.5	6.8	6.7	6.4	6.4	6.1	6.0	5.5	5.0	5.1	6.0
<b>Alaska Stations:</b>													
Saint Michael's, Fort, Alaska .....	12.9	12.9	12.9	11.9	10.0	10.4	11.3	12.2	12.5	14.2	12.9	12.0	12.3
Sitka, Alaska .....	10.3	9.5	9.5	8.7	8.7	6.9	7.3	6.2	7.6	9.0	11.2	12.3	8.9
Unalaska, Alaska .....	12.4	15.6	13.4	12.9	11.0	11.0	9.8	8.8	12.6	11.7	12.3	12.7	12.1
Behring's Island, Behring Sea .....	16.0	16.6	14.6	18.0	12.1	11.0	9.7	9.4	10.3	15.5	12.5	12.3	12.9

## APPENDIX 48.

*Average cloudiness, scale of 0 to 10, at stations of the Signal Service, United States Army, for each month and the year. (Computed from the commencement of observations at each, to and including December, 1884, from the three telegraphic observations.)*

[The monthly average is obtained by dividing the sums of the amount of cloudiness recorded daily by the number of observations taken.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
<b>New England:</b>													
Eastport, Me.	5.6	5.4	4.2	3.0	6.0	5.9	5.7	5.1	5.3	5.6	6.3	6.6	5.7
Portland, Me.	4.9	4.7	5.6	5.5	5.4	4.9	4.8	4.4	4.7	5.1	5.1	5.3	5.0
Mount Washington, N. H.	6.4	6.2	6.6	6.3	5.8	6.0	6.0	5.7	5.2	6.0	6.3	6.0	5.9
Boston, Mass.	5.4	4.9	5.5	5.0	5.2	4.9	5.1	4.6	4.6	4.9	5.1	5.5	5.1
Block Island, R. I.	5.4	4.7	5.0	4.6	4.6	3.6	4.1	4.3	4.6	4.8	4.9	5.0	4.7
New Haven, Conn.	5.4	5.0	5.5	5.0	5.1	4.8	4.9	4.8	4.8	4.0	5.0	5.4	5.1
New London, Conn.	5.1	4.7	5.2	5.2	4.6	4.5	4.7	4.5	4.7	4.6	4.9	5.1	4.8
<b>Middle Atlantic States:</b>													
Albany, N. Y.	5.0	5.6	6.1	5.9	5.2	4.9	5.0	5.0	5.0	5.7	6.7	7.1	5.6
New York City.	5.3	5.1	5.4	5.5	4.9	4.8	4.9	4.9	4.7	4.7	5.1	5.7	5.1
Philadelphia, Pa.	5.6	5.3	5.5	5.4	4.5	4.7	4.8	4.7	4.5	4.5	4.9	5.0	5.0
Atlantic City, N. J.	6.0	5.4	5.7	5.0	4.8	4.6	4.7	4.9	4.7	4.5	5.1	5.7	5.2
Barnegat City, N. J.	5.8	5.5	5.7	5.0	4.9	4.8	4.9	4.7	4.8	4.7	5.0	5.6	5.2
Cape May, N. J.	5.1	4.5	5.0	4.0	4.0	4.1	4.4	4.7	4.0	3.9	5.1	5.1	4.6
Sandy Hook, N. J.	5.5	5.2	5.4	5.6	4.6	4.5	4.7	4.6	4.9	4.6	4.9	5.6	5.0
Delaware Breakwater, Del.	6.4	5.4	5.0	5.3	4.4	5.0	4.8	4.7	4.3	4.7	4.9	5.6	5.1
Baltimore, Md.	5.6	5.3	5.4	5.4	4.7	4.0	4.0	5.0	4.6	4.5	4.8	5.3	5.0
Washington City.	6.0	5.6	5.5	5.4	4.8	5.0	4.6	4.9	4.7	4.7	5.1	5.7	5.2
Cape Henry, Va.	5.9	5.1	5.1	5.2	4.4	4.5	4.9	5.2	4.5	4.3	5.0	5.5	5.0
Chincoteague, Va.	6.4	5.0	4.8	5.3	4.2	4.7	4.9	4.9	3.9	4.6	4.5	5.3	4.8
Lyndburg, Va.	5.2	4.9	4.8	4.9	4.3	4.8	4.6	5.0	4.1	3.9	4.4	4.8	4.6
Norfolk, Va.	5.4	5.3	5.0	5.2	4.6	4.9	4.9	5.1	4.7	4.2	4.7	5.0	4.9
<b>South Atlantic States:</b>													
Charlotte, N. C.	6.4	5.3	5.2	5.4	4.9	5.2	5.1	5.1	4.5	4.8	4.6	5.2	5.2
Hatteras, N. C.	6.0	5.0	5.0	5.1	4.3	4.8	4.6	5.4	4.5	4.7	5.4	5.2	5.0
Kitty Hawk, N. C.	5.3	4.8	4.8	5.0	4.2	4.3	4.6	5.3	4.6	4.5	4.8	5.1	4.8
Macon, Port. N. C.	6.2	5.0	5.0	5.5	4.5	5.5	4.8	5.0	4.6	4.4	4.7	5.2	5.1
Smithville, N. C.	5.4	4.8	4.5	4.6	3.8	4.3	4.4	4.9	4.5	4.2	4.6	4.7	4.6
Wilmington, N. C.	5.4	5.2	4.8	4.6	4.5	4.9	5.0	5.4	5.0	4.1	4.8	5.0	4.9
Charleston, S. C.	4.0	4.0	4.2	4.2	4.1	4.7	4.6	5.0	4.7	3.6	4.2	4.6	4.5
Augusta, Ga.	5.0	4.8	4.0	4.5	4.0	4.0	4.5	5.0	4.4	3.8	4.7	4.8	4.6
Savannah, Ga.	5.1	4.8	4.3	4.5	4.3	4.0	4.7	5.2	4.8	4.1	4.7	4.6	4.7
Jacksonville, Fla.	4.7	4.6	3.9	4.1	4.0	4.6	4.1	4.3	4.0	4.3	4.7	4.6	4.3
<b>Florida Peninsula:</b>													
Cedar Keys, Fla.	4.4	3.7	3.5	3.4	3.5	4.0	4.2	4.5	3.1	2.9	3.8	4.0	3.8
Key West, Fla.	4.2	3.5	2.8	3.0	4.2	4.8	4.8	5.0	5.2	4.6	4.0	4.0	4.2
Sanford, Fla.	4.5	3.7	4.0	3.8	4.0	4.0	4.0	4.3	5.2	4.7	4.9	3.7	4.2
<b>Eastern Gulf States:</b>													
Atlanta, Ga.	6.3	5.4	4.9	4.9	4.5	5.2	4.8	5.4	4.1	4.6	4.8	5.4	5.1
Pensacola, Fla.	5.7	5.0	4.4	4.9	4.2	4.7	4.7	4.7	3.6	4.1	4.8	5.3	4.7
Mobile, Ala.	5.4	5.0	4.7	4.8	4.2	4.8	4.9	4.8	4.4	4.0	4.5	5.1	4.7
Montgomery, Ala.	6.2	5.5	4.8	4.9	4.4	5.1	4.8	4.8	4.4	4.3	4.8	5.6	4.9
Vicksburg, Miss.	5.8	5.5	4.9	4.5	4.3	4.0	4.2	4.0	4.4	3.8	4.8	5.4	4.6
New Orleans, La.	5.3	5.0	4.9	5.0	4.0	4.6	5.0	4.7	4.5	4.1	4.8	5.5	4.9
<b>Western Gulf States:</b>													
Shreveport, La.	5.9	5.6	5.2	5.0	4.8	4.5	4.2	3.6	3.7	3.9	4.7	5.5	4.7
Fort Smith, Ark.	5.1	6.4	5.2	5.3	4.3	3.9	4.2	4.0	3.5	4.6	4.5	5.1	4.7
Little Rock, Ark.	5.7	5.9	5.2	4.5	4.6	3.5	4.0	3.4	3.4	3.9	4.7	5.2	4.5
Galveston, Tex.	5.5	5.4	5.2	4.9	4.8	4.1	3.9	4.1	4.0	3.8	4.7	5.4	4.6
Indianola, Tex.	5.4	5.7	5.6	5.0	5.0	4.0	3.7	3.8	3.9	3.7	4.8	5.6	4.6
Palestine, Tex.	5.7	5.9	5.4	5.5	4.9	4.2	4.1	3.5	3.7	4.4	4.8	5.3	4.8
<b>Rio Grande Valley:</b>													
Brownsville, Tex.	5.8	5.6	5.5	5.3	4.6	3.9	3.8	4.6	4.7	4.2	5.5	5.8	4.9
Rio Grande City, Tex.	5.4	4.5	4.8	4.1	4.0	3.5	3.0	4.3	3.8	4.2	4.5	4.8	4.1
<b>Ohio Valley and Tennessee:</b>													
Chattanooga, Tenn.	6.3	5.9	5.3	5.1	4.3	4.4	4.2	4.8	4.2	4.7	4.8	5.9	5.0
Knoxville, Tenn.	6.4	5.7	5.3	5.0	4.4	5.0	4.0	4.5	4.0	3.9	5.2	6.4	5.0

*Average cloudiness, scale of 0 to 10, at stations of the Signal Service, United States Army, &c.—Continued.*

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
<b>Ohio Valley and Tennessee—Continued:</b>													
Memphis, Tenn.	5.9	5.9	5.1	5.0	4.7	4.3	4.4	4.0	3.9	4.0	5.3	5.8	4.8
Nashville, Tenn.	6.5	6.1	5.7	5.5	5.0	5.2	4.9	4.3	4.4	4.2	5.4	6.3	5.4
Louisville, Ky.	6.2	6.0	5.9	5.4	4.7	5.4	4.7	3.9	4.3	4.1	5.6	6.3	5.2
Indianapolis, Ind.	6.3	5.9	6.2	5.5	4.9	5.4	4.6	4.0	3.9	4.5	5.7	6.4	5.3
Cincinnati, Ohio.	6.4	6.1	5.9	5.3	4.4	5.1	4.5	4.2	4.2	4.4	5.7	6.5	5.3
Columbus, Ohio.	7.0	6.5	6.5	5.4	4.5	5.3	4.4	4.2	4.3	4.8	5.6	7.2	5.5
Pittsburg, Pa.	7.1	6.6	6.5	5.6	4.9	4.9	4.9	4.4	5.0	5.4	6.5	7.1	5.8
<b>Lower Lakes:</b>													
Buffalo, N. Y.	7.7	6.5	6.3	5.6	5.2	4.9	4.7	4.4	5.1	6.0	7.4	8.2	6.0
Owego, N. Y.	8.0	7.3	6.9	5.8	5.1	4.9	4.8	4.6	5.3	6.4	8.1	8.7	6.3
Rochester, N. Y.	7.9	6.9	6.7	5.6	4.8	4.7	4.6	4.3	5.0	6.0	7.7	8.4	6.0
Erie, Pa.	7.7	6.6	6.5	5.6	4.8	4.6	4.4	4.2	5.0	6.0	7.7	8.3	5.9
Cleveland, Ohio.	7.4	6.5	6.6	5.4	4.7	4.6	4.5	4.0	4.9	5.6	7.3	7.6	5.8
Sandusky, Ohio.	7.0	6.4	6.3	5.4	4.6	4.7	4.2	4.1	4.4	5.2	6.5	7.6	5.5
Toledo, Ohio.	7.0	6.4	6.4	5.6	5.0	5.1	4.7	4.3	4.6	5.5	6.5	7.3	5.7
Detroit, Mich.	7.0	6.1	6.3	5.4	4.9	5.0	4.3	4.0	4.4	5.1	6.2	6.9	5.5
<b>Upper Lakes:</b>													
Alpena, Mich.	7.1	6.2	5.8	4.8	4.9	4.6	4.3	4.1	5.2	6.0	7.2	7.8	5.7
Escanaba, Mich.	6.3	5.8	5.5	5.1	5.3	4.9	4.5	4.8	5.3	6.4	7.1	6.9	5.7
Grand Haven, Mich.	7.9	6.5	6.1	5.0	4.4	4.5	3.7	3.6	4.4	5.4	7.3	8.1	5.6
Mackinaw City, Mich.	7.0	6.2	5.0	5.2	5.8	5.1	5.4	4.0	5.0	6.4	7.7	8.8	6.0
Marquette, Mich.	6.7	6.1	5.4	5.1	4.8	4.8	4.4	4.3	5.8	6.6	7.1	7.3	5.7
Port Huron, Mich.	7.1	6.4	6.5	5.6	5.2	4.9	4.6	4.0	4.9	6.1	6.8	7.9	5.9
Chicago, Ill.	5.7	5.5	5.8	5.3	4.6	5.1	4.0	3.7	4.3	5.2	5.9	6.0	5.1
Milwaukee, Wis.	6.0	5.8	6.0	5.6	5.1	5.2	4.5	4.5	4.9	5.5	6.3	6.3	5.5
Duluth, Minn.	5.1	5.5	4.9	5.2	5.1	5.3	4.7	4.9	5.3	6.1	6.2	5.8	5.4
<b>Upper Mississippi Valley:</b>													
Saint Paul, Minn.	4.9	4.9	5.2	5.2	5.2	5.0	4.2	4.6	4.8	5.1	5.8	5.1	5.0
La Crosse, Wis.	4.8	4.8	5.3	4.6	5.0	4.9	4.2	4.3	4.5	5.2	5.8	5.4	4.9
Davenport, Iowa.	5.5	5.5	5.7	5.4	5.1	5.2	4.4	4.3	4.4	5.0	5.8	6.1	5.2
Des Moines, Iowa.	4.8	5.0	5.4	5.7	5.8	5.8	4.6	4.5	4.4	4.8	4.7	6.0	5.2
Dubuque, Iowa.	4.7	5.4	5.9	5.2	5.5	5.7	4.6	4.4	5.0	5.5	6.0	6.2	5.4
Keokuk, Iowa.	5.6	4.9	5.5	5.1	5.2	5.3	4.4	3.8	3.9	4.5	5.4	5.8	5.0
Cairo, Ill.	6.1	5.7	5.4	5.3	4.9	5.0	4.4	3.8	4.1	4.3	5.6	6.3	5.1
Springfield, Ill.	5.7	5.2	5.5	5.3	4.7	5.5	3.9	3.6	3.8	4.5	4.9	6.3	4.9
Saint Louis, Mo.	5.4	5.4	5.4	5.2	5.0	5.1	4.4	3.7	3.7	4.0	5.8	6.0	4.9
<b>Missouri Valley:</b>													
Leavenworth, Kans.	5.0	5.0	5.1	5.2	5.5	4.6	4.3	3.7	4.0	4.2	4.5	5.3	4.7
Omaha, Nebr.	5.0	4.9	5.4	5.4	5.8	5.1	4.4	4.2	4.0	4.2	4.5	5.2	4.8
Bennett, Fort, Dak.	4.7	4.8	5.4	5.8	5.5	4.6	4.8	4.0	4.1	4.9	4.5	5.1	4.9
Huron, Dak.	4.4	4.7	5.9	5.6	5.2	4.3	4.5	4.0	4.2	5.3	4.4	4.7	4.7
Yankton, Dak.	4.0	4.9	5.2	4.9	5.5	4.6	4.1	3.8	3.8	4.3	4.3	4.8	4.5
<b>Extreme Northwest:</b>													
Moorhead, Minn.	4.4	5.0	5.4	4.8	5.1	4.9	4.7	4.2	4.7	5.6	5.7	5.0	5.0
Saint Vincent, Minn.	4.4	4.6	4.6	4.5	4.4	4.5	4.6	4.0	4.5	5.8	5.6	4.2	4.6
Bismarck, Dak.	4.3	5.0	5.6	5.6	5.6	4.7	4.1	3.4	3.8	4.8	5.0	5.3	4.8
Buford, Fort, Dak.	5.2	4.6	5.1	4.8	4.7	4.8	4.1	3.4	3.9	5.4	5.3	4.9	4.8
<b>Northern Slope:</b>													
Assinaboine, Fort, Mont.	5.4	4.8	4.8	4.3	4.3	3.9	3.4	3.2	3.8	4.9	5.0	4.9	4.2
Benton, Fort, Mont.	6.0	5.5	4.9	5.0	4.7	4.4	3.3	2.7	4.1	5.6	5.4	5.5	4.8
Custer, Fort, Mont.	5.3	5.6	4.8	5.2	5.2	4.4	3.8	3.0	3.5	4.9	4.0	5.8	4.7
Helena, Mont.	6.4	5.3	4.3	4.4	4.9	4.9	3.2	2.9	3.3	4.7	4.6	5.1	4.5
Maginnis, Fort, Mont.	6.8	5.6	5.8	5.4	5.8	4.8	3.6	3.0	4.0	4.8	4.7	5.3	5.0
Poplar River, Mont.	4.0	4.2	4.3	3.8	3.1	2.7	3.3	2.5	3.2	4.2	3.9	4.3	4.6
Shaw, Fort, Mont.	5.4	4.7	4.4	4.6	4.7	4.2	3.3	2.9	3.7	5.0	4.6	4.9	4.4
Deadwood, Dak.	4.2	4.6	5.0	5.3	5.3	4.6	3.4	3.2	3.8	3.9	4.1	4.7	4.3
Cheyenne, Wyo.	3.5	3.4	4.2	4.9	5.2	3.8	3.9	3.7	3.2	3.7	3.5	3.8	3.9
North Platte, Nebr.	4.0	4.2	5.1	5.0	5.7	4.4	4.1	3.8	3.7	4.2	4.2	4.6	4.4
<b>Middle Slope:</b>													
Denver, Colo.	3.2	3.4	4.1	4.8	5.0	3.7	4.1	4.1	3.1	3.4	3.2	3.4	3.8
Pike's Peak, Colo.	3.7	4.2	4.5	4.7	4.6	3.8	4.8	4.7	3.6	3.6	3.4	3.7	4.1
West Las Animas, Colo.	3.8	3.1	3.7	4.7	5.4	4.0	4.4	3.9	3.1	3.5	2.7	4.4	4.1
Dodge City, Kans.	4.1	4.0	4.1	4.0	4.9	3.5	4.1	3.4	3.1	3.3	3.7	4.1	3.9
Elliott, Fort, Tex.	3.1	3.1	3.5	3.3	4.4	3.3	3.8	3.4	3.2	3.7	3.1	3.4	3.4
<b>Southern Slope:</b>													
Sill, Fort, Ind. T.	4.6	4.8	4.2	3.6	4.6	3.5	3.7	3.2	3.6	3.7	4.0	4.7	4.0
Conecho, Fort, Tex.	3.9	4.2	3.6	3.1	4.0	3.5	3.5	3.6	4.1	4.4	3.9	3.9	3.7
Davis, Fort, Tex.	3.3	3.4	3.3	2.5	2.8	2.9	3.5	3.6	3.5	3.5	3.4	3.3	3.1
Stockton, Fort, Tex.	2.9	3.5	3.1	2.9	3.3	3.0	3.2	3.1	2.9	2.9	3.0	3.3	3.1
<b>Southern Plateau:</b>													
Santa Fe, N. Mex.	3.5	3.8	3.8	4.0	3.9	3.4	5.1	5.0	3.1	2.5	3.1	3.3	3.7
El Paso, Tex.	3.2	3.3	2.8	2.5	2.9	3.0	3.8	3.5	3.0	3.1	3.3	3.3	3.1
Apache, Fort, Ariz.	3.4	4.0	3.5	3.0	1.8	2.0	4.8	5.0	2.3	2.2	2.1	3.0	3.1
Grant, Fort, Ariz.	3.5	3.9	3.5	2.3	2.0	2.2	5.1	4.8	2.0	1.8	2.1	3.1	3.1

*Average cloudiness, scale of 0 to 10, at stations of the Signal Service, United States Army, &c.—Continued.*

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
<b>Southern Plateau—Continued:</b>													
Prescott, Ariz.....	2.9	2.8	3.1	2.7	1.8	1.4	3.1	3.3	1.7	1.7	1.6	2.7	2.4
Thomas, Camp, Ariz.....	3.4	4.0	3.5	2.3	1.8	2.1	4.0	4.2	2.3	2.3	2.3	2.9	3.0
Yuma, Ariz.....	2.3	2.2	2.1	1.6	1.0	0.8	1.5	2.1	1.0	1.4	1.7	1.9	1.6
<b>Middle Plateau:</b>													
Winnemucca, Nev.....	4.5	4.6	4.2	4.6	4.3	3.3	1.7	1.4	2.0	2.6	3.4	4.4	3.5
Salt Lake City, Utah.....	5.3	5.3	5.4	5.3	4.6	3.1	2.9	3.0	2.6	4.0	4.5	5.7	4.3
<b>Northern Plateau:</b>													
Boisé City, Idaho.....	5.7	6.1	5.3	5.2	5.0	4.1	2.5	2.0	3.1	4.5	4.5	6.1	4.6
Lewiston, Idaho.....	6.9	5.8	4.9	4.8	4.3	4.5	2.8	2.1	3.1	5.0	5.4	6.5	4.7
Dayton, Wash.....	6.4	5.6	4.9	5.2	4.5	4.5	2.9	2.1	3.6	5.2	5.3	7.0	4.7
Spokane Falls, Wash.....	5.9	6.0	4.9	5.0	4.6	5.0	3.8	2.2	3.7	6.0	6.1	4.2	4.7
<b>North Pacific Coast:</b>													
Canby, Fort, Wash.....	5.7	3.9	4.7	5.2	5.0	6.7	7.0	4.8	4.6	5.4	5.6	5.8	5.2
Olympia, Wash.....	7.8	7.2	6.6	6.7	6.2	5.9	4.6	4.5	5.2	6.8	7.4	7.8	6.4
Tatoosh Island, Wash.....	6.7	5.5	6.3	6.0	5.1	6.8	7.0	4.3	6.7	5.8	7.3	6.7	6.1
Portland, Oreg.....	7.1	7.2	7.1	6.6	6.5	5.8	3.9	3.8	4.3	5.8	6.7	7.2	6.0
Roseburg, Oreg.....	7.0	6.6	5.7	6.0	5.0	4.6	3.0	2.2	3.2	5.5	6.1	6.7	5.1
<b>Middle Pacific Coast:</b>													
Cape Mendocino, Cal.....	4.9	3.4	5.0	6.0	4.1	3.4	2.5	1.4	2.3	3.6	2.9	4.6	3.9
Red Bluff, Cal.....	4.4	4.5	4.0	4.1	3.5	1.7	1.1	0.6	1.1	2.1	2.9	4.3	2.8
Sacramento, Cal.....	4.2	4.3	3.7	3.6	2.7	1.5	0.5	0.4	0.8	1.9	2.5	2.8	2.5
San Francisco, Cal.....	4.7	4.7	4.0	4.1	3.7	4.0	4.7	4.2	3.4	3.2	3.6	4.5	4.1
<b>South Pacific Coast:</b>													
Los Angeles, Cal.....	3.1	4.0	4.5	4.7	4.2	4.5	3.0	2.6	2.4	2.6	2.3	3.2	3.4
San Diego, Cal.....	4.1	4.4	4.8	4.5	5.3	5.0	4.6	4.1	3.7	3.8	3.5	3.8	4.3
<b>Alaska Stations:</b>													
Saint Michael's, Fort, Alaska.....	6.3	4.4	5.7	6.7	7.2	7.2	7.7	8.2	8.2	7.8	6.3	5.3	6.7
Sitka, Alaska.....	7.2	5.7	6.1	6.0	7.2	7.6	8.3	6.6	6.8	6.7	7.6	6.7	6.9
Unalashka, Alaska.....	8.7	8.9	7.6	8.7	8.6	8.6	7.4	7.9	8.2	8.5	8.4	8.2	8.0



## APPENDIX 49.

*Average number of clear, fair, and cloudy days, at stations of the Signal Service, United at each to and including December, 1884,*

[Cloudiness is recorded on a scale of 0 to 10, each observation. Clear

Stations.	January.			February.			March.			April.			May.			June.		
	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.
<b>New England:</b>																		
Eastport, Me. ....	7.2	21.8	12.0	6.7	11.2	10.5	6.2	10.4	14.4	6.9	8.7	14.4	6.2	11.1	13.7	5.9	11.3	12.8
Portland, Me. ....	9.6	12.2	9.2	9.1	11.5	7.6	7.2	11.8	12.0	7.6	11.2	11.2	7.9	12.2	10.9	8.1	13.7	8.2
Mt. Washington, N. H. ....	4.9	10.9	15.2	6.1	9.1	13.2	6.0	9.8	15.2	7.0	8.8	14.2	7.3	12.2	11.5	6.8	10.5	12.7
Boston, Mass. ....	7.8	10.3	12.9	8.7	9.0	10.6	8.5	9.6	12.9	6.9	11.6	11.2	7.4	14.5	9.1	8.4	11.7	9.9
Block Island, R. I. ....	8.8	13.2	9.0	9.0	13.2	6.0	11.5	12.0	7.5	11.0	11.8	7.2	11.0	10.4	6.0	13.3	12.2	4.5
New Haven, Conn. ....	8.2	12.0	10.8	8.1	10.7	9.5	7.6	12.3	11.1	6.7	12.1	11.2	9.2	13.2	8.6	9.0	12.8	8.2
New London, Conn. ....	8.8	13.3	8.9	10.4	10.6	7.3	8.9	12.6	9.5	7.9	13.1	9.0	10.6	13.1	7.3	10.4	13.2	6.4
<b>Middle Atlantic States:</b>																		
Albany, N. Y. ....	5.8	12.6	12.6	7.4	10.4	10.4	6.0	13.0	12.0	7.8	11.3	10.9	9.3	13.3	8.4	8.7	12.9	8.4
New York City ....	7.4	12.1	11.5	7.7	10.9	9.7	7.3	13.6	10.1	7.7	12.3	10.0	9.4	13.3	8.3	8.1	14.8	7.1
Philadelphia, Pa. ....	6.4	11.9	12.7	7.4	10.6	10.3	7.4	11.4	12.2	7.8	11.6	10.6	11.1	11.0	8.9	8.8	13.6	7.6
Atlantic City, N. J. ....	7.6	10.9	12.5	8.5	10.5	9.2	8.9	12.0	10.1	8.9	10.6	10.5	9.8	13.6	7.6	10.7	12.7	6.6
Barnegat City, N. J. ....	6.8	12.2	12.0	7.7	11.0	9.5	6.5	14.1	10.4	7.6	11.0	11.4	8.6	15.7	6.7	7.8	16.2	6.0
Cape May, N. J. ....	10.7	9.4	10.9	10.4	8.0	9.8	10.1	9.6	11.3	10.3	8.6	11.1	14.3	9.4	7.3	13.1	9.0	7.9
Sandy Hook, N. J. ....	7.9	11.9	11.2	8.7	11.4	8.2	7.3	14.6	9.1	7.4	12.6	10.6	9.9	14.1	7.0	9.1	13.8	7.1
<b>Delaware Br'kwater,</b>																		
Del. ....	4.5	12.8	13.7	7.8	11.0	9.6	6.8	14.2	10.0	8.8	12.6	8.6	12.4	12.6	6.0	8.2	14.6	7.2
Baltimore, Md. ....	7.1	13.2	10.7	7.5	12.6	8.1	8.6	11.7	10.7	7.5	12.7	9.8	10.6	12.2	8.2	7.6	15.2	7.2
Washington City. ....	5.9	11.9	13.2	6.6	11.9	9.7	7.4	12.5	11.1	8.1	12.1	9.8	10.8	11.9	8.3	7.9	15.4	6.7
Cape Henry, Va. ....	7.2	11.2	12.6	8.5	11.4	8.4	8.6	12.6	9.8	10.0	10.2	9.8	12.0	12.2	6.8	10.5	13.1	6.4
Chincoteague, Va. ....	5.0	13.8	12.2	6.5	15.5	6.2	9.8	13.5	7.7	8.2	13.6	8.2	10.8	12.6	7.6	8.0	17.2	4.8
Lynchburg, Va. ....	8.8	11.6	10.6	9.2	11.2	8.0	11.5	10.9	8.6	9.9	11.5	8.6	12.2	15.1	6.6	9.6	11.9	8.5
Norfolk, Va. ....	8.8	11.1	11.1	8.4	11.0	8.8	9.9	11.0	10.1	9.6	10.5	9.9	11.0	12.4	7.6	9.6	12.7	7.7
<b>South Atlantic States:</b>																		
Charlotte, N. C. ....	5.8	10.5	14.7	8.7	8.3	11.3	8.7	13.5	8.8	8.3	12.3	9.4	9.8	13.2	8.0	7.8	13.8	8.4
Hatteras, N. C. ....	5.8	13.7	11.5	7.8	12.5	8.0	9.5	10.5	11.0	7.8	14.0	8.2	9.8	14.7	6.5	7.0	18.5	4.5
Kitty Hawk, N. C. ....	9.4	12.0	9.6	9.4	10.3	8.6	10.4	11.8	8.8	9.4	13.2	7.4	12.7	12.4	5.9	11.2	13.1	5.7
Macon, Fort, N. C. ....	4.6	14.2	28.2	8.0	11.5	8.8	9.5	12.2	9.3	8.8	10.0	11.2	9.0	16.2	5.8	5.2	16.3	8.5
Smithville, N. C. ....	7.3	12.3	11.4	9.2	9.5	9.6	10.9	10.5	9.6	9.6	11.7	8.7	12.2	23.2	5.6	10.6	13.1	6.3
Wilmington, N. C. ....	8.8	10.8	11.4	8.7	8.3	11.3	11.4	9.7	9.9	11.4	10.6	8.0	11.1	12.6	7.3	9.5	12.6	7.9
Charleston, S. C. ....	9.5	10.5	11.0	11.2	9.4	7.6	12.6	10.7	7.7	11.9	11.3	6.8	11.4	13.9	5.7	9.0	14.4	6.6
Augusta, Ga. ....	10.6	9.5	10.9	8.1	11.7	8.4	12.0	10.2	8.8	10.8	11.5	7.7	12.4	13.0	5.6	8.1	15.0	6.9
Savannah, Ga. ....	9.0	10.8	11.2	9.3	10.4	8.6	11.5	11.2	8.3	11.5	10.6	7.9	11.0	13.9	6.1	7.3	15.4	7.3
Jacksonville, Fla. ....	9.1	12.8	9.1	9.8	10.5	8.0	12.7	12.8	5.5	12.2	11.7	6.1	10.8	14.7	5.5	8.3	14.5	7.2
<b>Florida Peninsula:</b>																		
Cedar Keys, Fla. ....	9.8	14.0	7.0	12.4	8.4	5.2	13.2	13.8	4.0	15.8	10.2	4.0	14.6	12.4	4.0	7.2	18.8	4.0
Key West, Fla. ....	12.1	13.9	5.0	12.1	12.4	3.9	16.1	12.3	2.6	14.5	12.9	2.6	9.5	17.1	4.4	6.2	18.7	5.1
Sauford, Fla. ....	11.0	11.0	9.0	16.0	10.0	3.0	13.0	14.0	4.0	12.5	13.5	4.0	12.0	15.0	4.0	3.0	20.5	6.5
<b>Eastern Gulf States:</b>																		
Atlanta, Ga. ....	5.8	11.7	13.5	8.8	8.8	10.7	11.5	10.3	9.2	9.8	12.2	8.0	11.5	12.5	7.0	7.1	14.2	8.7
Pensacola, Fla. ....	5.8	14.4	10.8	9.8	10.2	8.4	12.0	10.8	8.2	10.2	12.0	7.8	12.2	12.0	6.8	10.2	14.0	5.8
Mobile, Ala. ....	8.0	11.8	11.2	8.6	10.8	8.8	11.3	10.3	9.4	10.1	11.0	8.9	12.2	12.8	6.0	9.5	13.9	6.6
Montgomery, Ala. ....	6.0	11.1	13.9	7.3	10.5	10.4	11.2	10.0	9.8	10.3	10.4	9.3	11.2	14.3	5.5	7.3	14.3	8.4
Vicksburg, Miss. ....	6.8	10.5	13.7	7.7	9.8	10.8	10.3	10.5	10.2	10.5	11.9	7.6	12.2	11.9	6.9	10.0	15.2	4.8
New Orleans, La. ....	7.8	12.3	10.9	8.5	10.6	9.2	9.9	10.7	10.4	10.5	10.3	9.2	10.1	14.3	6.6	7.9	16.2	5.9
<b>Western Gulf States:</b>																		
Shreveport, La. ....	7.8	10.4	12.8	8.2	9.5	10.6	8.6	12.4	10.0	9.5	12.6	7.9	8.9	14.8	7.3	9.2	16.1	4.7
Fort Smith, Ark. ....	10.8	10.4	9.8	5.5	8.5	14.5	9.0	13.0	9.0	10.0	8.5	11.5	10.0	14.0	7.0	12.3	14.0	3.7
Little Rock, Ark. ....	7.6	10.6	12.8	8.4	6.8	13.2	11.0	9.2	10.8	11.4	11.8	6.8	11.0	14.2	7.2	13.6	14.0	2.4
Galveston, Tex. ....	8.3	9.5	13.2	7.4	10.7	10.2	8.3	12.3	10.4	9.8	10.3	9.9	9.6	14.6	6.8	12.0	13.4	4.6
Indianola, Tex. ....	8.4	12.4	10.2	6.3	11.2	10.7	7.0	14.2	9.8	8.9	12.4	8.7	8.1	15.1	7.8	9.8	16.8	3.4
Palestine, Tex. ....	10.0	13.5	7.5	7.5	8.5	12.5	7.0	13.0	11.0	7.0	15.7	7.3	7.7	16.3	7.0	9.7	18.0	2.3
<b>Rio Grande Valley:</b>																		
Brownsville, Tex. ....	8.1	9.4	13.5	7.6	8.5	12.1	7.5	10.5	13.0	6.8	13.2	10.0	9.2	15.0	6.8	12.9	13.8	3.3
Rio Grande City, Tex. ....	9.8	10.2	11.0	11.0	9.0	8.2	11.3	11.4	8.3	14.0	10.0	6.0	9.4	15.9	5.7	14.7	11.0	4.3



## APPENDIX 49.

*States Army, for each month and the year. (Computed from the commencement of observations from the three telegraphic observations.)*

days comprise from 0 to 8; fair, 9 to 22, and cloudy, 23 to 30, inclusive.

July.			August.			September.			October.			November.			December.			Annual.		
Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.
5.2	14.4	11.4	8.6	11.5	10.9	8.2	10.9	10.9	7.7	11.2	12.1	5.4	11.1	13.5	5.8	11.7	13.5	81.8	138.1	145.4
8.5	14.5	8.0	11.2	12.5	7.3	10.4	11.1	8.5	8.8	11.6	10.6	9.1	10.8	10.1	8.6	13.1	9.3	102.9	148.4	113.6
6.2	11.4	13.4	7.9	12.5	10.6	7.3	10.4	12.3	6.8	9.5	14.7	5.7	8.1	16.2	6.4	9.0	15.6	79.2	122.3	103.8
7.2	13.0	9.9	11.1	11.3	8.6	10.4	10.1	9.5	9.8	11.4	9.8	8.8	10.2	11.0	7.8	11.2	12.5	103.0	134.0	128.3
13.2	13.3	4.5	10.5	16.3	4.2	11.2	12.4	6.4	10.6	12.0	8.4	10.0	12.0	8.0	7.4	14.2	9.4	122.5	161.0	81.8
8.5	14.8	7.7	10.4	12.9	7.7	10.7	10.5	8.8	10.7	12.2	8.1	10.3	11.2	8.5	8.8	12.0	10.2	138.2	140.6	110.5
9.1	15.0	6.9	10.3	12.8	7.9	11.2	10.5	8.3	10.9	12.6	7.5	10.5	10.8	8.7	9.2	12.9	8.9	119.2	150.2	95.9
9.3	14.3	7.4	12.1	12.4	6.5	9.4	12.0	8.6	7.9	12.6	10.5	4.6	11.2	14.2	3.9	11.4	15.7	92.1	147.3	125.9
7.6	15.7	7.7	9.8	12.4	8.8	9.6	11.7	8.7	10.3	12.7	8.0	9.0	11.1	9.9	5.9	13.9	12.1	99.8	153.6	111.9
9.4	13.7	7.9	10.6	10.1	10.3	11.2	10.6	8.2	11.2	11.8	8.0	9.1	10.9	10.0	6.0	12.9	12.0	106.5	140.0	118.8
10.7	13.5	6.8	11.1	10.4	9.5	11.7	10.1	8.2	12.8	10.2	8.0	10.4	9.9	9.7	9.4	11.3	10.3	120.3	135.9	109.1
8.7	15.6	6.7	9.6	14.1	7.3	10.0	12.7	7.3	10.8	12.2	8.0	10.3	10.1	9.0	7.9	12.6	10.5	102.5	157.4	105.4
12.3	11.7	7.1	12.6	9.0	9.4	13.3	8.4	8.3	14.7	8.2	8.1	10.2	8.4	11.4	9.8	9.5	12.2	140.4	109.2	115.7
8.5	15.3	7.2	10.5	12.5	8.0	10.1	11.8	8.1	10.8	12.5	7.7	9.7	11.2	9.1	6.9	13.6	10.5	105.3	155.9	104.0
10.0	14.6	6.4	9.8	14.2	7.0	12.4	11.2	6.4	12.4	10.8	7.8	10.6	9.8	9.6	6.0	15.6	9.4	105.5	159.8	100.0
9.1	14.4	7.5	10.0	12.2	8.8	11.1	11.2	7.7	11.5	11.8	7.7	10.2	10.7	9.1	8.1	13.3	9.6	109.1	151.1	105.1
9.0	14.3	7.7	9.2	13.4	8.4	11.3	10.4	8.3	11.4	11.4	8.2	8.8	11.8	9.4	7.7	12.6	10.7	104.1	148.5	111.7
9.0	15.0	7.0	8.8	14.0	8.2	11.4	10.4	8.2	13.3	10.2	7.5	10.3	9.4	10.3	7.7	12.1	11.2	117.3	141.6	106.5
8.2	16.8	6.9	9.6	13.2	8.2	12.6	10.2	5.4	10.8	12.4	7.8	12.0	10.0	8.0	8.3	13.4	9.3	111.4	106.5	87.4
10.1	14.4	6.5	10.1	12.2	8.7	12.5	11.1	6.4	15.2	9.4	6.4	11.5	11.5	7.0	10.1	11.8	9.1	131.6	139.4	94.3
8.7	14.4	7.9	9.1	13.4	8.5	11.3	10.2	8.5	13.9	9.9	7.2	11.4	9.6	9.0	9.6	12.0	9.4	121.3	137.6	106.4
7.5	16.5	7.0	9.0	13.2	8.8	10.8	11.3	7.9	11.5	10.0	9.5	12.7	7.6	9.7	9.1	11.9	10.0	108.5	143.3	113.5
8.5	15.2	7.3	9.5	12.0	11.2	9.5	12.5	8.0	10.0	14.0	7.0	8.2	14.0	7.8	6.2	14.8	10.0	97.8	106.5	101.0
9.2	15.9	6.0	8.0	15.2	7.8	11.7	10.9	7.4	12.0	11.4	7.6	10.7	10.9	8.4	8.5	13.4	9.1	125.5	147.8	92.0
9.8	12.2	9.0	7.0	14.2	9.8	10.8	12.0	7.2	10.3	14.2	6.5	10.5	12.3	7.2	7.0	15.8	8.2	100.4	161.3	103.6
9.6	14.6	6.8	8.4	13.4	9.2	11.3	9.9	8.8	12.5	10.2	8.3	10.0	11.5	8.5	10.0	11.6	9.4	121.5	141.6	102.2
9.4	14.3	7.3	8.6	13.1	9.3	9.8	10.8	9.4	13.8	9.7	7.5	11.4	9.3	9.3	10.5	11.4	9.1	124.4	133.2	107.7
10.0	15.0	6.0	8.7	14.9	7.4	10.6	10.7	8.7	14.2	10.1	6.7	11.7	10.4	7.9	11.4	10.8	8.8	132.5	142.3	90.5
10.3	14.6	6.1	8.2	15.5	7.3	10.6	12.5	6.9	14.6	9.8	6.4	10.7	9.9	9.4	10.1	11.0	9.9	126.8	144.6	93.9
9.1	16.0	5.9	7.2	15.5	6.3	9.0	11.7	9.3	12.3	11.6	7.1	10.3	11.1	8.6	10.6	10.7	9.7	118.2	149.1	98.0
9.9	16.2	4.9	9.3	14.6	5.1	9.5	12.3	8.2	11.6	11.4	8.0	9.7	11.1	9.2	10.6	11.8	8.6	124.0	156.1	85.2
11.4	15.0	4.6	1.6	15.0	4.4	16.2	12.2	1.6	19.4	8.2	3.4	13.6	10.6	5.8	14.3	10.8	5.9	162.0	149.2	54.2
6.2	19.6	5.2	4.8	20.6	5.6	3.5	20.2	6.3	8.1	16.0	6.9	10.4	14.0	5.6	10.8	15.7	4.5	114.8	192.9	57.1
9.0	15.5	2.5	5.5	23.5	2.0	7.0	16.5	5.5	11.0	14.5	5.5	9.5	13.0	7.5	13.0	14.5	3.5	131.0	191.0	44.0
10.0	14.7	6.3	7.2	15.3	8.5	12.8	11.2	6.0	12.6	9.7	8.7	11.0	10.1	8.9	8.1	12.3	10.6	114.8	145.3	105.2
10.2	14.8	6.0	10.4	14.8	5.8	14.4	11.0	4.6	14.2	10.0	6.8	10.7	11.2	8.1	8.7	11.5	10.4	128.2	146.4	90.8
8.7	14.8	7.5	8.8	15.1	7.1	12.8	10.1	7.1	13.9	9.9	7.2	11.5	10.3	3.2	9.9	11.4	9.7	127.8	141.8	95.7
8.4	16.0	6.6	8.7	15.9	6.4	11.5	11.4	7.1	13.3	9.2	8.5	11.4	9.8	8.8	8.7	10.2	12.1	118.0	143.2	104.1
10.3	15.5	5.7	11.2	15.5	4.3	12.8	10.3	6.9	14.6	9.9	6.5	9.9	11.0	9.1	8.6	10.0	12.4	124.0	141.4	98.9
7.9	17.1	6.0	8.2	18.2	4.6	10.8	12.8	6.4	12.9	11.7	6.4	10.0	10.1	9.9	7.4	11.9	11.7	111.9	156.1	97.3
11.2	15.4	4.4	13.1	15.1	2.8	14.5	9.4	6.1	14.6	10.6	5.8	10.8	10.1	9.1	9.7	9.3	12.0	126.1	146.1	93.1
11.7	14.5	5.0	13.7	12.3	5.0	15.7	9.7	4.6	10.7	13.0	7.3	10.6	11.8	7.6	9.3	11.3	10.4	128.4	140.4	96.7
12.1	16.3	5.3	16.0	11.5	3.5	15.3	9.2	5.5	13.6	11.4	6.0	12.7	8.2	9.1	10.7	8.9	11.4	146.6	126.5	92.3
11.4	18.2	3.4	12.5	13.9	4.6	12.6	11.9	5.5	14.4	10.8	5.8	10.6	10.8	8.6	8.5	10.8	11.7	128.4	146.1	94.6
13.2	15.8	2.0	12.4	15.7	2.9	12.2	12.9	4.9	14.6	11.8	4.6	10.0	11.9	8.1	8.5	11.0	11.5	124.2	157.2	83.9
11.7	17.0	2.3	13.3	15.0	2.7	13.7	12.3	4.0	10.3	15.3	4.4	11.0	11.0	8.0	8.3	13.0	9.7	129.8	157.3	78.6
13.8	14.1	3.1	4.7	15.7	4.6	11.0	12.7	5.4	12.3	13.4	5.3	8.5	11.7	9.8	7.3	12.7	11.0	119.5	150.2	95.4
15.1	10.9	5.0	12.8	12.3	5.9	14.6	11.9	3.5	13.1	11.4	6.5	11.0	9.3	9.7	9.7	10.4	10.9	156.1	130.1	73.1







*Average number of clear, fair, and cloudy days at stations*

Stations.	January.			February.			March.			April.			May.			June.		
	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.
Southern Plateau.—																		
Continued:																		
Apache, Fort, Ariz. ....	15.3	10.2	5.5	13.7	8.5	6.2	17.0	8.3	5.7	17.0	10.7	2.3	23.2	6.2	1.6	22.3	5.5	2.2
Grant, Fort, Ariz. ....	16.2	9.5	5.3	13.2	8.5	6.7	16.0	9.7	5.3	20.4	8.6	1.0	22.9	6.0	2.1	19.3	9.0	1.7
Prescott, Ariz. ....	18.1	10.8	2.1	17.2	7.5	3.6	17.8	9.3	3.9	19.7	8.1	2.2	24.2	5.9	0.9	24.7	4.6	0.7
Thomas, Camp, Ariz. ....	16.3	12.4	2.3	12.0	12.2	4.0	16.0	10.2	4.8	18.8	8.8	2.4	23.6	6.4	1.0	20.0	8.4	1.6
Yuma, Ariz. ....	20.3	8.3	1.4	18.6	7.1	2.7	21.8	7.3	1.9	23.4	5.6	1.0	27.2	3.1	0.7	27.1	2.7	0.2
Middle Plateau:																		
Winnemucca, Nev. ....	11.7	12.0	7.3	10.0	10.5	7.7	13.2	11.1	6.7	10.7	12.2	7.1	13.3	12.2	5.5	15.0	12.6	2.4
Salt Lake City, Utah. ....	8.2	11.6	11.2	7.5	10.8	10.0	9.7	10.8	10.5	7.6	12.6	9.8	10.7	13.0	7.3	15.2	11.7	3.1
Northern Plateau:																		
Boise City, Idaho. ....	7.3	9.3	14.4	6.3	10.3	11.7	9.0	12.6	9.4	8.0	13.3	8.7	9.1	15.2	6.7	11.3	14.1	4.6
Lewiston, Idaho. ....	4.0	9.4	17.6	6.4	9.4	12.6	9.6	12.6	8.8	10.2	11.4	8.4	11.2	13.2	6.6	10.6	12.6	6.8
Dayton, Wash. ....	3.0	11.0	17.0	7.0	9.6	11.8	9.6	13.6	7.8	9.0	11.2	9.8	10.8	13.0	7.2	10.0	13.8	6.2
Spokane Falls, Wash. ....	6.0	12.7	12.3	7.5	8.0	12.8	10.2	12.5	8.3	9.2	12.0	8.8	9.8	14.7	6.5	9.0	13.2	7.8
North Pacific Coast:																		
Canby, Fort, Wash. ....	8.0	10.0	13.0	13.0	10.0	6.0	7.0	19.0	5.0	7.0	16.0	7.0	8.0	15.0	8.0	2.0	17.0	11.0
Olympia, Wash. ....	2.3	9.3	19.4	3.4	7.4	17.4	4.6	10.4	16.0	4.3	12.3	13.4	6.6	11.3	13.1	6.0	11.1	12.9
Tatoosh Island, Wash. ....	9.0	4.0	18.0	10.0	9.0	10.0	4.0	13.0	14.0	8.0	8.0	14.0	11.0	11.0	9.0	3.0	12.0	15.0
Portland, Oreg. ....	3.9	7.2	19.9	2.8	6.4	19.0	4.4	7.5	19.1	5.3	9.1	15.6	5.5	10.0	15.5	6.9	9.6	13.5
Roseburg, Oreg. ....	3.2	10.0	17.8	4.1	8.1	16.0	6.7	10.4	13.9	4.3	10.7	15.0	8.7	11.3	11.0	11.0	9.9	9.1
Middle Pacific Coast:																		
Cape Mendocino, Cal. ....	9.0	8.0	14.0	13.0	8.0	8.0	11.5	8.0	11.5	6.0	13.5	10.5	11.0	15.0	5.0	13.5	12.5	4.0
Red Bluff, Cal. ....	13.9	8.3	8.8	11.4	8.9	8.0	13.7	10.3	7.0	13.0	9.9	7.1	15.9	10.0	5.1	23.4	4.7	1.9
Sacramento, Cal. ....	12.6	9.9	8.5	12.2	8.3	7.7	15.4	7.6	8.0	14.4	9.9	5.7	20.0	7.7	3.3	24.8	4.0	1.2
San Francisco, Cal. ....	11.7	10.1	9.2	9.5	10.2	8.5	11.5	11.4	8.1	12.0	11.6	6.4	14.4	10.7	5.9	12.3	10.9	6.8
South Pacific Coast:																		
Los Angeles, Cal. ....	17.4	8.4	5.2	12.7	9.3	6.3	12.0	10.9	8.1	10.3	12.6	7.1	12.6	12.4	6.0	8.4	16.0	5.6
San Diego, Cal. ....	11.5	11.3	8.2	8.9	11.3	8.0	8.4	13.1	9.5	9.7	12.7	7.6	7.5	12.6	10.9	6.8	15.0	8.2
Alaska Stations:																		
Saint Michael's, Fort, Alaska. ....	6.4	9.4	15.2	12.4	7.0	8.9	8.5	10.4	12.1	5.7	9.0	15.3	4.1	9.9	17.0	3.5	10.7	15.8
Sitka, Alaska. ....	4.3	9.2	17.5	7.5	9.2	11.7	7.0	8.2	15.8	6.8	9.6	13.6	5.8	9.8	15.4	6.7	6.2	17.1
Unalashka, Alaska. ....	1.6	5.4	24.0	0.8	3.6	24.0	2.8	6.4	21.8	1.4	4.7	23.9	0.8	8.2	22.0	0.8	5.5	23.7

of the Signal Service, United States Army, &c.—Continued.

July.			August.			September.			October.			November.			December.			Annual.		
Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.
10.7	12.7	7.6	10.1	14.9	6.0	18.0	8.0	4.0	21.6	7.1	2.3	21.4	6.3	2.3	17.0	8.9	5.1	207.5	109.0	48.8
8.7	15.9	6.4	9.4	15.0	6.6	20.1	7.4	2.5	21.5	6.9	2.6	20.1	7.3	2.6	17.1	7.9	6.0	203.5	113.3	48.6
16.6	11.6	2.8	15.2	13.1	2.7	24.1	4.8	1.1	23.2	6.5	1.3	22.4	6.3	1.3	19.5	8.7	2.8	234.8	102.0	28.6
12.0	14.4	4.6	10.4	16.8	3.8	10.8	7.8	2.4	20.3	8.2	2.5	20.4	7.6	2.0	16.8	9.4	4.8	204.3	124.8	36.2
23.0	7.3	0.7	2.8	7.7	1.5	26.1	3.0	0.3	23.8	6.5	0.7	22.9	5.9	1.2	21.6	7.4	2.0	279.9	71.1	14.3
24.0	6.5	0.7	25.8	4.3	0.9	22.2	5.5	2.3	18.5	9.8	2.7	15.5	10.5	4.0	13.8	10.0	7.7	189.8	117.5	57.9
16.5	11.8	2.7	16.2	11.9	2.9	17.7	0.6	2.7	12.8	11.6	6.6	10.8	10.7	8.5	8.3	9.9	12.8	143.3	133.8	88.2
18.1	11.6	1.3	21.7	8.0	1.3	16.6	8.0	4.5	12.4	10.6	8.0	11.0	10.8	8.2	7.3	9.1	14.6	134.6	131.9	98.8
16.8	11.4	2.8	22.3	7.0	1.7	16.0	10.0	4.0	9.0	11.0	11.0	8.6	9.8	11.6	7.0	8.2	15.8	132.3	125.5	107.6
17.4	10.8	2.8	21.8	8.2	1.0	12.4	12.0	4.0	9.0	12.6	9.4	10.4	10.4	9.2	5.3	9.3	16.4	127.4	134.8	101.2
13.5	12.0	5.5	20.8	8.5	1.7	13.8	11.5	4.7	6.5	11.5	13.0	5.0	12.8	12.3	4.8	11.5	14.7	129.3	137.3	98.7
1.0	16.0	14.0	11.0	14.0	0.0	10.6	9.7	9.7	10.0	11.0	10.0	9.5	8.0	12.5	6.7	13.5	10.8	101.6	158.8	105.6
10.7	13.0	7.3	11.0	13.6	6.4	6.1	12.0	11.9	3.6	12.0	15.4	2.5	9.6	17.9	2.0	7.6	21.4	64.1	127.9	173.3
2.0	14.0	15.0	14.0	10.0	7.0	4.0	15.0	11.0	7.5	11.5	12.0	3.0	9.0	18.0	5.5	9.0	16.5	81.0	128.0	157.0
14.7	7.7	8.6	14.8	9.1	7.1	11.8	10.0	8.2	7.2	10.0	13.8	5.2	8.9	15.9	4.1	7.5	19.4	87.8	103.1	174.9
17.2	9.8	4.0	10.9	9.0	2.1	15.6	8.9	5.5	7.0	13.7	10.3	3.7	13.3	12.9	2.0	10.7	18.3	103.4	125.8	136.1
19.0	10.0	2.0	23.7	6.3	1.0	19.0	8.0	3.0	15.0	12.3	3.7	10.8	14.4	4.8	8.0	12.5	10.5	165.0	132.5	68.0
27.7	3.2	0.1	28.5	2.4	0.1	25.2	3.0	0.9	21.2	7.2	2.5	20.2	5.4	4.4	12.8	9.6	8.6	227.7	81.7	55.3
29.6	1.3	0.1	29.5	1.5	0.0	25.9	3.0	0.5	23.4	5.5	2.1	19.6	6.5	3.9	13.2	8.0	9.8	240.0	74.9	50.4
8.2	15.4	7.4	9.3	14.8	6.9	12.9	12.6	4.5	15.2	11.6	4.3	14.9	9.6	5.5	12.9	9.5	8.6	146.7	139.0	79.6
12.1	13.1	0.8	16.6	13.3	1.1	17.5	11.1	1.4	17.5	10.6	2.9	19.0	9.0	2.0	17.0	8.9	5.1	171.3	142.4	51.6
8.2	16.6	6.2	9.5	17.1	4.4	12.1	13.6	4.3	13.2	12.3	5.5	13.6	10.4	6.0	12.9	11.4	6.7	122.3	157.6	85.4
3.2	7.4	20.4	2.1	6.3	22.6	1.9	8.2	10.9	2.6	8.6	19.8	6.7	9.0	14.3	9.6	9.6	11.8	65.9	106.2	193.1
3.0	8.6	19.4	7.4	9.2	14.4	8.6	7.0	14.4	7.0	8.0	16.0	3.5	6.9	19.6	7.2	8.8	15.0	72.5	113.5	188.2
1.0	8.5	21.5	2.5	7.0	21.5	0.8	5.2	24.0	1.3	6.0	23.7	1.2	6.0	22.8	1.0	6.4	23.6	14.0	102.0	248.0

## APPENDIX 50.

*Directions from which the prevailing winds have been observed to blow at stations on the Central Pacific and Southern Pacific Railroads and connecting branches during each month of the year 1884.*

[Copied from the records on file at the office of the chief engineer of the Central Pacific Railroad.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Alta, Cal.	S.	SE.	S.	S.	NE.	S.	S.	S.	S.	S.	N.	S.	S.
Anaheim, Cal.	N.	W.	SE.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SE.	SW.
Antioch, Cal.	SE.	NW.	W.	W.	W.	W.	W.	W.	W.	W.	W.	W.	W.
Aptos, Cal.	(1)	(1)	(1)	(1)	(1)	(1)	NW.	N.	SW.	NE.	NE.	NE.	.....
Auburn, Cal.	SE.	SE.	SE.	SE.	SE.	SE.	E.	E.	E.	S.	E.	S.	SE.
Battle Mountain, Nev.	SW.	SW.	NE.	NE.	SW.	SW.	S.	S.	S.	SW.	SE.	W.	SW.
Benson, Ariz.	W.	S.	W.	W.	SW.	(1)	W.	W.	W.	W.	E.	W.	.....
Beowawa, Nev.	S.	S.	S.	W.	S.	W.	N.	N.	SE.	S.	S.	S.	S.
Bishop Creek, Nev.	(1)	(1)	N.	N.	S.	S.	W.	S.	N.	S.	S.	N.	N.
Blue Creek, Utah.	E.	E.	SW.	N.	S.	NE.	NE.	N.	N.	N.	W.	SW.	N.
Boca, Cal.	N.	SW.	N.	SW.	SW.	SW.	S.	SW.	SW.	N.	W.	SW.	SW.
Borden, Cal.	SE.	SE.	SE.	{NE. SE.}	NW.	NW.	NW.	NW.	NW.	NW.	SW.	SE.	NW.
Brentwood, Cal.	NW.	W.	W.	W.	W.	W.	W.	W.	W.	W.	W.	W.	W.
Brighton, Cal.	N.	N.	SE.	SE.	S.	S.	S.	SW.	N.	N.	N.	SE.	N.
Brown's, Nev.	SW.	SW.	SW.	SW.	SW.	SW.	SE.	SW.	{SW. W.}	W.	(1)	SW.	.....
Byron, Cal.	NW.	W.	SE.	W.	NW.	W.	W.	W.	W.	W.	W.	SE.	W.
Cabazon, Cal.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	W.	W.	W.	E.	W.	.....
Caliente, Cal.	W.	SE.	W.	W.	W.	W.	E.	W.	W.	W.	W.	W.	W.
Callistoga, Cal.	SE.	W.	W.	W.	W.	W.	W.	W.	W.	W.	W.	SW.	W.
Carlin, Nev.	N.	W.	W.	W.	W.	W.	W.	W.	W.	W.	N.	W.	W.
Casa Grande, Ariz.	E.	W.	W.	SW.	N.	N.	W.	W.	S.	SW.	W.	W.	W.
Chico, Cal.	S.	N.	S.	S.	S.	S.	S.	S.	S.	S.	N.	S.	S.
Chualar, Cal.	S.	S.	S.	N.	N.	N.	N.	N.	N.	N.	N.	N.	N.
Ciaco, Cal.	SW.	SW.	SW.	NE.	NE.	SW.	SW.	E.	SW.	SW.	SW.	SW.	SW.
Colfax, Cal.	N.	S.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.
Colton, Cal.	N.	SE.	W.	W.	W.	SW.	SW.	SW.	SW.	SW.	N.	SW.	SW.
Corinne, Utah.	N.	N.	S.	N.	S.	S.	N.	N.	N.	N.	N.	N.	N.
Daggett, Cal.	W.	W.	W.	W.	W.	W.	W.	W.	(1)	.....	.....	.....	.....
Davisville, Cal.	N.	N.	S.	W.	S.	W.	S.	S.	S.	E.	W.	S.	S.
Delano, Cal.	S.	S.	SW.	SW.	(1)	S.	SE.	SE.	SE.	S.	SE.	SE.	.....
Delta, Cal.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	N.	NW.	N.	.....
Deming, N. Mex.	E.	W.	W.	W.	W.	W.	W.	W.	SW.	E.	E.	E.	W.
Dunnigan, Cal.	S.	N.	S.	N.	N.	S.	SE.	SE.	N.	N.	N.	N.	N.
Elko, Nev.	N.	N.	W.	N.	N.	W.	N.	N.	N.	N.	N.	W.	N.
El Paso, Tex.	N.	W.	S.	S.	S.	(1)	S.	(1)	S.	(1)	W.	W.	.....
Emigrant Gap, Cal.	E.	E.	S.	S.	E.	E.	E.	SE.	E.	E.	E.	SE.	E.
Farmington, Cal.	SE.	SE.	SE.	SE.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	SE.	NW.
Fenner, Cal.	SW.	W.	E.	W.	W.	(1)	W.	(1)	SE.	(1)	.....	.....	.....
Fresno City, Cal.	SE.	SE.	SE.	N.	N.	NW.	NW.	(1)	NW.	NW.	SE.	S.	.....
Galt, Cal.	SE.	SE.	SE.	SE.	NW.	W.	W.	NW.	W.	NW.	{NW. SW.}	SE.	SE.
Gilroy, Cal.	N.	W.	SW.	W.	W.	W.	W.	W.	W.	N.	S.	S.	W.
Golconda, Nev.	E.	SW.	W.	E.	NW.	(1)	SW.	W.	W.	E.	E.	NW.	.....
Goshen, Cal.	SE.	SE.	SW.	SE.	NW.	NW.	NW.	NW.	NW.	(1)	(1)	SW.	.....
Halleck, Nev.	S.	SW.	SW.	SW.	SW.	SW.	SW.	S.	(1)	SW.	SW.	SW.	.....
Hawthorne, Nev.	(1)	(1)	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	SW.	.....
Hollister, Cal.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	SE.	NW.
Hot Springs, Nev.	NW.	(1)	N.	N.	N.	NE.	N.	W.	SW.	NW.	NE.	SW.	.....
Humboldt, Nev.	NE.	SW.	N.	N.	SW.	N.	SW.	(1)	N.	S.	(1)	N.	.....
Indio, Cal.	N.	SW.	(1)	NW.	NW.	NW.	NE.	NE.	NE.	NE.	W.	NE.	.....
Ione, Cal.	SW.	SW.	SW.	SW.	(1)	SW.	SW.	SW.	SW.	SW.	SW.	SE.	.....
Keeler, Cal.	(1)	(1)	(1)	S.	S.	N.	N.	N.	N.	N.	N.	N.	.....
Keene, Cal.	SE.	SE.	NW.	NW.	NW.	NW.	(1)	NW.	NW.	SE.	S.	{SE. NW.}	.....
Kelton, Utah.	N.	S.	S.	N.	W.	N.	S.	N.	(1)	S.	S.	S.	.....
Kingsburg, Cal.	SE.	SE.	SE.	N.	N.	N.	(1)	N.	N.	N.	N.	S.	.....
Knight's Landing, Cal.	N.	N.	N.	S.	S.	S.	SE.	(1)	SE.	N.	(1)	S.	.....
Lathrop, Cal.	SE.	SE.	SE.	SE.	W.	W.	W.	(1)	NW.	W.	W.	S.	.....

<sup>1</sup> No record.

<sup>2</sup> Observations discontinued.

*Directions from which the prevailing winds have been observed to blow at stations on the Central Pacific and Southern Pacific Railroads, &c.—Continued.*

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Lemoore, Cal. ....	NW.	NW.	S.	NW.	NW.	NW.	NW.	NW.	( <sup>1</sup> )	NW.	NW.	NW.	W.
Livermore, Cal. ....	E.	SW.	SW.	SW.	W.	W.	W.	W.	W.	W.	SW.	SW.	W.
Lordsburg, N. Mex.	SE.	SE.	SE.	SW.	SW.	SE.	SE.	SE.	SE.	SE.	W.	SE.	SE.
Los Angeles, Cal. ....	NW.	SW.	SE.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.
Mammoth Tank, Cal. ....	NE.	NE.	SW.	SW.	SW.	NE.	NE.	SW.	NE.	NW.	( <sup>1</sup> )	SW.	SW.
Maricopa, Ariz. ....	( <sup>1</sup> )	W.	W.	W.	W.	E.	E.	E.	E.	E.	E.	E.	E.
Martinez, Cal. ....	SW.	W.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.
Marysville, Cal. ....	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.
Memlo Park, Cal. ....	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.
Merced, Cal. ....	N.	N.	S.	N.	N.	N.	N.	N.	N.	N.	N.	N.	N.
Modesto, Cal. ....	S.	S.	S.	S.	NW.	NW.	( <sup>1</sup> )	N.	N.	N.	S.	S.	S.
Mojave, Cal. ....	( <sup>1</sup> )	NW.	SW.	SE.	SE.	SE.	SE.	SE.	( <sup>1</sup> )	NW.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Monterey, Cal. ....	SE.	NW.	S.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	SE.	SE.	NW.
Napa City, Cal. ....	NW.	SE.	W.	W.	W.	SW.	NW.	W.	( <sup>1</sup> )	NW.	S.	S.	S.
Needles, Ariz. ....	NW.	S.	NW.	NW.	NW.	SE.	SE.	SE.	( <sup>1</sup> )	SW.	SW.	SW.	SW.
Newhall, Cal. ....	NE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.
Niles, Cal. ....	SE.	NE.	SW.	SE.	SW.	SW.	W.	W.	NW.	NW.	NW.	NW.	NW.
Oakland, Cal. ....	S.	W.	W.	W.	W.	W.	W.	W.	W.	W.	W.	W.	W.
Ogden City, Utah. ....	S.	S.	S.	E.	S.	S.	S.	S.	S.	S.	S.	S.	S.
Orland, Cal. ....	N.	N.	N.	S.	S.	S.	SE.	N.	N.	N.	N.	N.	N.
Otego, Nev. ....	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.
Pajaro, Cal. ....	( <sup>1</sup> )	E.	SW.	( <sup>1</sup> )	W.	S.	SW.	( <sup>1</sup> )	SW.	W.	W.	SW.	SW.
Palaio, Nev. ....	W.	N.	N.	N.	N.	W.	W.	SW.	S.	SW.	SE.	SE.	W.
Pantano, Ariz. ....	E.	E.	E&W	E.	E.	( <sup>1</sup> )	W.	W.	E.	E.	E.	E.	E.
Petaluma, Cal. ....	SE.	W.	W.	W.	W.	W.	W.	W.	( <sup>1</sup> )	W.	W.	W.	W.
Pleasanton, Cal. ....	S.	S.	S.	SW.	S.	S.	S.	S.	S.	S.	S.	S.	S.
Promontory, Utah. ....	NE.	NE.	NE.	NE.	NE.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.
Ravenna, Cal. ....	NE.	NE.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	NE.	NE.	SW.
Red Bluff, Cal. ....	N.	N.	N.	S.	S.	S.	S.	S.	S.	N.	N.	N.	N.
Redding, Cal. ....	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	SW.	SW.	SW.	SW.	( <sup>1</sup> )	SW.	N.	{ SE }	{ SE }	{ SE }
Reno, Nev. ....	E.	SW.	SW.	SW.	N.	SW.	W.	W.	W.	W.	W.	SW.	{ W. SW. }
Rocklin, Cal. ....	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	( <sup>1</sup> )	SE.	( <sup>1</sup> )	SE.	{ SE. SE. }
Sacramento, Cal. ....	N.	N.	S.	S.	S.	S.	S.	S.	S.	S.	N.	S.	S.
Salinas, Cal. ....	S.	S.	S.	S.	S.	W.	S.	W.	S.	S.	W.	S.	S.
San Fernando, Cal. ....	S.	S.	S.	S.	S.	( <sup>1</sup> )	S.	SE.	SW.	S.	N.	N.	N.
San José, Cal. ....	S.	S.	NW.	NW.	NW.	NW.	NW.	NW.	( <sup>1</sup> )	NW.	NW.	NW.	NW.
San Mateo, Cal. ....	NW.	NW.	NW.	NW.	NW.	NW.	( <sup>1</sup> )	NW.	NW.	NW.	NW.	NW.	NW.
San Simon, Ariz. ....	E.	E.	W.	W.	W.	W.	W.	E&W	E.	E.	E.	E.	E.
Santa Cruz, Cal. ....	NE.	NE.	NE.	N.	S.	S.	SE.	N.	N.	N.	N.	N.	N.
Soledad, Cal. ....	S.	S.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.
Soquel, Cal. ....	N.	N.	N.	N&S.	N.	N.	N.	( <sup>1</sup> )	N.	N.	N.	N.	N.
South Vallejo, Cal. ....	SE.	SW.	SE.	W.	SW.	SW.	SW.	( <sup>1</sup> )	SW.	SE.	{ SE. NW. }	{ SE. NW. }	{ SE. NW. }
Spadra, Cal. ....	N.	E.	S.	W.	N.	W.	S.	S.	W.	W.	W.	N.	W.
Stockton, Cal. ....	SE.	SE.	S.	SE.	W.	NW.	W.	W.	W.	W.	W.	SE.	W.
Suisun, Cal. ....	NE.	NE.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.
Summit, Cal. ....	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.
Summer, Cal. ....	N.	N.	N.	N.	N.	N.	W.	W.	S.	W.	W.	S.	N.
Tecoma, Nev. ....	W.	W.	W.	SW.	W.	W.	W.	W.	SW.	( <sup>1</sup> )	SW.	SW.	SW.
Tehama, Cal. ....	N.	N.	N.	S.	( <sup>1</sup> )	S.	S.	S.	N.	N.	N.	N.	N.
Tehichipa, Cal. ....	SE.	SE.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	SE.	NE.	NW.	NW.
Tennant, Cal. ....	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.
Terrace, Utah. ....	NW.	NW.	NW.	W.	W.	W.	W.	SW.	( <sup>1</sup> )	N.	N.	N.	N.
Texas Hill, Ariz. ....	N.	S.	W.	W.	W.	S&W	E.	S.	S.	W.	E.	SW.	W&S
Toano, Nev. ....	S.	S.	SW.	S.	S.	W.	W.	W.	W.	W.	W.	W.	W.
Tracy, Cal. ....	S.	W.	S.	S.	W.	W.	W.	W.	W.	W.	W.	SE.	W.
Truckee, Cal. ....	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	( <sup>1</sup> )	NW.	N.	N.	N.
Tucson, Ariz. ....	SW.	W.	E.	SE.	S.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.
Tulare, Cal. ....	S.	N.	SW.	S.	NW.	NW.	NW.	NW.	NW.	SE.	S.	NW.	NW.
Turlock, Cal. ....	SW.	S.	S.	S.	N.	N.	N.	N.	N.	S.	S.	N.	N.
Wadsworth, Nev. ....	SE.	N.	W.	W.	N.	W.	W.	S.	S.	N.	E.	W.	W.
Wells, Nev. ....	SW.	W.	SW.	S.	SW.	SW.	SW.	W.	W.	W.	S.	SW.	SW.
Willcox, Ariz. ....	N.	W.	W.	W.	W.	W.	E.	E.	W.	E.	E.	W.	W.
Williams, Cal. ....	N.	N.	S.	S.	S.	S.	S.	S.	S.	N.	S.	S.	S.
Willow, Cal. ....	S.	S.	S.	S.	S.	S.	S.	S.	W.	S.	S.	S.	S.
Winnemucca, Nev. ....	NE.	SE.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	NE.	SW.	SW.	SW.
Woodland, Cal. ....	N.	N.	N.	N.	S.	S.	S.	N.	( <sup>1</sup> )	S.	N.	N.	N.
Yuma, Ariz. ....	NE.	NE.	W.	W.	NW.	( <sup>1</sup> )	SE.	NW.	( <sup>1</sup> )	SW.	SE.	( <sup>1</sup> )	( <sup>1</sup> )

<sup>1</sup> No record.

<sup>2</sup> Observations discontinued.

## APPENDIX 51.

*Directions from which the prevailing winds have been observed to blow at stations of the Signal Service, United States Army, during each month of the year. (Computed from the commencement of observations at each to and including December, 1884.)*

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
<b>New England:</b>												
Eastport, Me. ....	NW.	NW.	NW.	S.	S.	S.	S.	S.	S.	S.	NW.	NW.
Portland, Me. ....	NW.	NW.	NW.	NW.	S.	S.	S.	S.	S.	S.	NW.	NW.
Mt. Washington, N.H.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.
Boston, Mass. ....	NW.	NW.	NW.	NW.	SW.	{SW}	SW.	W.	SW.	W.	W.	W.
Block Island, R. I. ....	N.	NW.	NW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	NW.	NW.
New Haven, Conn. ....	NW.	NW.	NW.	NW.	S.	S.	S.	S.	SW.	SW.	N.	N.
New London, Conn. ....	NW.	NW.	NW.	NW.	SW.	SW.	SW.	SW.	N.	N.	NW.	NW.
<b>Middle Atlantic States:</b>												
Albany, N. Y. ....	S.	NW.	NW.	NW.	S.	S.	S.	S.	S.	S.	NW.	NW.
New York City. ....	W.	NW.	NW.	NW.	SW.	SW.	SW.	SW.	SW.	NW.	W.	W.
Philadelphia, Pa. ....	NW.	NW.	NW.	NW.	SW.	SW.	SW.	SW.	SW.	NW.	NW.	NW.
Atlantic City, N. J. ....	NW.	NW.	NW.	NW.	S.	S.	S.	S.	S.	SW.	NW.	NW.
Barnegat City, N. J. ....	NW.	NW.	NW.	NW.	S.	S.	S.	S.	SW.	NW.	NW.	NW.
Cape May, N. J. ....	NW.	NW.	NW.	NW.	S.	S.	S.	S.	S.	NW.	NW.	NW.
Sandy Hook, N. J. ....	W.	NW.	NW.	NW.	SE.	SE.	SW.	SW.	SW.	NW.	NW.	W.
Del. Breakwater, Del. ....	NW.	NW.	NW.	NW.	NE.	SW.	S.	NE.	SW.	NE.	NW.	NW.
Baltimore, Md. ....	NW.	NW.	NW.	NW.	SE.	S.	SW.	S.	N.	NW.	NW.	NW.
Washington City. ....	NW.	NW.	NW.	NW.	S.	S.	S.	S.	S.	NW.	NW.	NW.
Cape Henry, Va. ....	NW.	N.	NW.	S.	SE.	SE.	SW.	NE.	NE.	NE.	NW.	NW.
Chincoteague, Va. ....	NW.	NW.	NW.	NW.	S.	S.	S.	NE.	S.	S.	NW.	NW.
Lynchburg, Va. ....	SW.	NW.	NW.	NE.	S.	SW.	SW.	NE.	NE.	NE.	W.	SW.
Norfolk, Va. ....	N.	NE.	N.	SW.	SW.	SW.	SW.	SW.	NE.	NE.	N.	N.
<b>South Atlantic States:</b>												
Charlotte, N. C. ....	{NE}	SW.	SW.	SW.	SW.	SW.	SW.	NE.	NE.	NE.	SW.	SW.
Hatteras, N. C. ....	{SW}	NE.	NE.	NE.	NE.	SW.	SW.	NE.	NE.	NE.	NE.	NE.
Kitty Hawk, N. C. ....	NE.	NE.	NE.	NE.	NE.	SW.	SW.	NE.	NE.	NE.	NE.	NE.
Macon, Ga. ....	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	NE.	N.	N.	N.
Smithville, N. C. ....	N.	N.	SW.	SW.	SW.	SW.	SW.	SW.	N.	N.	N.	N.
Wilmington, N. C. ....	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	NE.	NE.	NE.	SW.
Charleston, S. C. ....	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	NE.	NE.	NE.	NE.
Augusta, Ga. ....	NW.	NW.	NW.	NW.	SE.	S.	SE.	NE.	NE.	NE.	NW.	NW.
Savannah, Ga. ....	NW.	NW.	S.	SW.	S.	SW.	SW.	SW.	NE.	NE.	N.	NW.
Jacksonville, Fla. ....	NE.	NE.	SW.	SW.	NE.	SW.	SW.	NE.	NE.	NE.	NE.	NE.
<b>Florida Peninsula:</b>												
Cedar Keys, Fla. ....	NE.	NE.	{SW}	SW.	W.	W.	W.	NE.	NE.	NE.	NE.	NE.
Key West, Fla. ....	NE.	E.	E.	E.	E.	E.	E.	E.	E.	NE.	NE.	NE.
Sanford, Fla. ....	NW.	SE.	SW.	SW.	SW.	E.	SW.	NE.	NE.	NE.	NE.	NE.
<b>Eastern Gulf States:</b>												
Atlanta, Ga. ....	NW.	NW.	NW.	NW.	E.	NW.	W.	E.	E.	E.	NW.	NW.
Pensacola, Fla. ....	N.	SE.	S.	S.	SE.	SW.	SW.	S.	SE.	NE.	N.	N.
Mobile, Ala. ....	N.	N.	S.	S.	S.	S.	S.	S.	N.	N.	N.	N.
Montgomery, Ala. ....	NW.	NW.	NW.	S.	SE.	SE.	SW.	E.	E.	E.	NW.	NW.
Vicksburg, Miss. ....	N.	SE.	S.	S.	SE.	SW.	SW.	SE.	N.	N.	SE.	SE.
New Orleans, La. ....	N.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	E.	E.	N.	N.
<b>Western Gulf States:</b>												
Shreveport, La. ....	S.	S.	S.	S.	S.	S.	S.	SE.	SE.	SE.	S.	S.
Fort Smith, Ark. ....	E.	E.	E.	E.	E.	E.	E.	E.	E.	E.	E.	E.
Little Rock, Ark. ....	NW.	NW.	NW.	S.	S.	S.	SW.	NE.	NE.	SE.	S.	NW.
Galveston, Tex. ....	N.	SE.	NE.	SE.	SE.	S.	S.	SE.	SE.	SE.	N.	N.
Indianola, Tex. ....	N.	S.	SE.	S.	SE.	S.	S.	S.	SE.	SE.	N.	N.
Palestine, Tex. ....	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.
<b>Rio Grande Valley:</b>												
Brownsville, Tex. ....	N.	S.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	N.	N.
Rio Grande City, Tex.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.
<b>Ohio Valley and Tennessee:</b>												
Chattanooga, Tenn. ....	NE.	S.	NW.	SW.	S.	SW.	SW.	NE.	NE.	NE.	S.	S.
Knoxville, Tenn. ....	SW.	SW.	SW.	SW.	SW.	SW.	SW.	NE.	NE.	NE.	NE.	SW.
Memphis, Tenn. ....	NW.	NW.	SE.	SE.	SE.	SW.	SW.	NW.	NW.	NW.	NW.	NW.



*Directions from which the prevailing winds have been observed to blow at stations of the Signal Service, United States Army, &c.—Continued.*

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
<b>Ohio Valley and Tennessee—Continued:</b>												
Nashville, Tenn.....	NW.	NW.	NW.	NW.	S.	W.	W.	NW.	NW.	SE.	NW.	NW.
Louisville, Ky.....	SW.	S.	W.	S.	S.	S.	SW.	N.	S.	S.	S.	W.
Indianapolis, Ind.....	W.	NW.	NW.	NW.	SE.	SW.	SW.	N.	S.	S.	S.	W.
Cincinnati, Ohio.....	SW.	NW.	NW.	NW.	SE.	SE.	SW.	NE.	SE.	SE.	SE.	NW.
Columbus, Ohio.....	S.	W.	{NW}	W.	S.	SW.	S.	{N}	S.	S.	S.	W.
Pittsburg, Pa.....	W.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	W.	W.
<b>Lower Lakes:</b>												
Buffalo, N. Y.....	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	W.	W.
Oswego, N. Y.....	{SE}	{S}	NW.	W.	W.	W.	W.	S.	S.	S.	S.	S.
Rochester, N. Y.....	W.	W.	W.	W.	W.	W.	W.	SW.	SW.	SW.	W.	W.
Erie, Pa.....	SW.	W.	W.	NE.	W.	S.	W.	S.	S.	S.	S.	SW.
Cleveland, Ohio.....	SW.	W.	W.	NE.	SE.	SE.	N.	SE.	SE.	SE.	SW.	SW.
Sandusky, Ohio.....	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.
Toledo, Ohio.....	SW.	SW.	W.	W.	{NE}	SW.	SW.	SW.	S.	SW.	SW.	SW.
Detroit, Mich.....	SW.	W.	NW.	NE.	SW.	SW.	SW.	SW.	SW.	SW.	W.	SW.
<b>Upper Lakes:</b>												
Alpena, Mich.....	W.	W.	NW.	NW.	NW.	SE.	NW.	NW.	NW.	NW.	W.	W.
Escanaba, Mich.....	NW.	N.	N.	N.	S.	S.	S.	S.	S.	S.	W.	W.
Grand Haven, Mich.....	W.	W.	NW.	NW.	SW.	SW.	SW.	SW.	S.	S.	W.	W.
Mackinaw City, Mich.....	W.	W.	NW.	E.	W.	W.	NW.	E.	NW.	NW.	NW.	NW.
Marquette, Mich.....	W.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	W.	W.	W.	W.
Port Huron, Mich.....	S.	N.	N.	NE.	S.	S.	S.	NE.	S.	S.	S.	SW.
Chicago, Ill.....	SW.	SW.	NW.	N.	N.	SW.	SW.	NE.	SW.	SW.	SW.	SW.
Milwaukee, Wis.....	NW.	NW.	NW.	NE.	NE.	SW.	SW.	SW.	SW.	SW.	NW.	W.
Duluth, Minn.....	SW.	NE.	NE.	NE.	NE.	NE.	NE.	NE.	NE.	NE.	SW.	SW.
<b>Upper Mississippi Valley:</b>												
Saint Paul, Minn.....	NW.	SE.	NW.	NW.	SE.	SE.	SE.	SE.	SE.	SE.	NW.	NW.
La Crosse, Wis.....	S.	S.	N.	N.	S.	S.	S.	S.	S.	S.	S.	S.
Davenport, Iowa.....	NW.	NW.	NW.	NW.	E.	SW.	SW.	SW.	SW.	SW.	NW.	NW.
Des Moines, Iowa.....	N.	NW.	N.	N.	SW.	S.	SW.	SW.	SW.	S.	NW.	NW.
Dubuque, Iowa.....	NW.	NW.	NW.	NW.	SE.	SE.	S.	S.	S.	NW.	NW.	NW.
Keokuk, Iowa.....	NW.	NW.	NW.	NE.	S.	S.	SW.	S.	S.	S.	NW.	NW.
Cairo, Ill.....	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.
Springfield, Ill.....	S.	NW.	NW.	S.	S.	S.	S.	S.	S.	S.	S.	S.
Saint Louis, Mo.....	S.	NW.	NW.	S.	S.	S.	S.	S.	S.	S.	S.	S.
<b>Missouri Valley:</b>												
Leavenworth, Kans.....	S.	S.	N.	S.	S.	S.	S.	S.	S.	S.	S.	S.
Omaha, Nebr.....	NW.	N.	N.	N.	SE.	S.	S.	S.	S.	S.	NW.	NW.
Bennett, Fort, Dak.....	NW.	NW.	NW.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	NW.	NW.
Huron, Dak.....	NW.	NW.	NW.	NW.	SE.	SE.	SE.	SE.	SE.	SE.	NW.	NW.
Yankton, Dak.....	NW.	NW.	NW.	NW.	SE.	SE.	SE.	SE.	NW.	NW.	NW.	NW.
<b>Extreme Northwest:</b>												
Moorhead, Minn.....	N.	N.	N.	N.	N.	S.	S.	SE.	S.	SE.	S.	N.
Saint Vincent, Minn.....	NW.	NW.	NW.	NW.	NW.	S.	NW.	NW.	NW.	NW.	NW.	NW.
Bismarck, Dak.....	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.
Buford, Fort, Dak.....	NW.	W.	NW.	E.	E.	E.	E.	E.	W.	W.	W.	W.
<b>Northern Slope:</b>												
Assinaboine, Fort, Mont.....	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.
Benton, Fort, Mont.....	W.	SW.	W.	NE.	W.	W.	SW.	W.	SW.	SW.	SW.	SW.
Custer, Fort, Mont.....	SE.	SW.	SE.	NW.	SE.	NW.	SE.	SE.	N.	N.	SE.	N.
Helena, Mont.....	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.
Maginnis, Fort, Mont.....	W.	W.	W.	W.	W.	SW.	SW.	NW.	NW.	NW.	W.	W.
Poplar River, Mont.....	NW.	NW.	NW.	SW.	SE.	SW.	NW.	SE.	W.	W.	W.	NW.
Shaw, Fort, Mont.....	SW.	SW.	W.	W.	W.	W.	W.	W.	W.	W.	W.	SW.
Deadwood, Dak.....	SW.	SW.	SW.	NE.	{NE}	{SW}	SW.	NE.	NE.	NE.	SW.	NE.
Cheyenne, Wyo.....	W.	W.	NW.	NW.	NW.	NW.	S.	NW.	NW.	NW.	NW.	NW.
North Platte, Nebr.....	NW.	NW.	NW.	NW.	SE.	SE.	SE.	SE.	SE.	NW.	NW.	NW.
<b>Middle Slope:</b>												
Denver, Colo.....	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.
Pike's Peak, Colo.....	SW.	W.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	W.	W.
West Las Animas, Colo.....	W.	W.	E.	W.	E.	E.	E.	E.	S.	NE.	NW.	W.
Dodge City, Kans.....	N.	N.	N.	N.	S.	S.	S.	S.	S.	S.	N.	N.
Elliott, Fort, Tex.....	N.	S.	NE.	S.	SE.	S.	SE.	SE.	S.	SE.	NW.	N.
<b>Southern Slope:</b>												
Sill, Fort, Ind. T.....	N.	N.	N.	S.	S.	S.	SE.	SE.	S.	S.	N.	N.
Concho, Fort, Tex.....	SW.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	SW.
Davis, Fort, Tex.....	SW.	SW.	SW.	SW.	SW.	SW.	E.	E.	NE.	SW.	SW.	SW.
Stockton, Fort, Tex.....	SW.	SW.	SW.	SE.	SE.	SE.	SE.	SE.	SE.	S.	SW.	SW.

*Directions from which the prevailing winds have been observed to blow at stations of the Signal Service, United States Army, &c.—Continued.*

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
<b>Southern Plateau:</b>												
Santa Fé, N. Mex. ....	N.	N.	SW.	SW.	{ E. SW.	{ SW. W.	E.	E.	E.	SW.	N.	N.
El Paso, Tex. ....	W.	W.	W.	W.	W.	W.	W.	E.	W.	W.	W.	W.
Apache, Fort, Ariz. ....	NE.	SW.	NE.	SW.	E.	E.	E.	E.	NE.	NE.	NE.	NE.
Grant, Fort, Ariz. ....	NE.	N.	N.	NW.	N.	N.	N.	E.	N.	N.	N.	N.
Prescott, Ariz. ....	SW.	S.	S.	S.	S.	S.	S.	S.	S.	S.	SW.	S.
Thomas, Camp, Ariz. ....	SE.	NW.	W.	W.	W.	W.	NW.	SE.	SE.	SE.	SE.	SE.
Yuma, Ariz. ....	N.	N.	W.	W.	W.	SW.	SE.	SE.	SW.	NE.	N.	N.
<b>Middle Plateau:</b>												
Winnemucca, Nev. ....	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	NE.	NE.
Salt Lake City, Utah. ....	SE.	SE.	SE.	NW.	NW.	NW.	NW.	SE.	NW.	NW.	NW.	NW.
<b>Northern Plateau:</b>												
Boisé City, Idaho. ....	SE.	SE.	SE.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.
Lewiston, Idaho. ....	E.	E.	E.	W.	W.	NE.	NE.	NE.	NE.	NE.	E.	E.
Dayton, Wash. ....	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.
Spokane Falls, Wash. ....	{ NE. SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	NE.	SW.
<b>North Pacific Coast:</b>												
Canby, Fort, Wash. ....	E.	N.	W.	W.	W.	W.	W.	W.	S.	S.	S.	SE.
Olympia, Wash. ....	S.	S.	S.	S.	S.	{ N. SW.	N.	N.	S.	S.	S.	S.
Tatoosh Island, Wash. ....	E.	E.	E.	E.	{ SW. W.	{ SW. SW.	SW.	SW.	E.	E.	E.	E.
Portland, Oreg. ....	S.	S.	S.	S.	NW.	NW.	NW.	NW.	NW.	S.	S.	S.
Roseburg, Oreg. ....	SW.	NW.	SW.	NW.	NW.	N.	N.	N.	NW.	NW.	SW.	SW.
<b>Middle Pacific Coast:</b>												
Cape Mendocino, Cal. ....	NW.	NW.	SE.	NW.	NW.	NW.	NW.	N.	N.	N.	SE.	NW.
Red Bluff, Cal. ....	N.	N.	S.	S.	S.	S.	S.	S.	N.	N.	N.	N.
Sacramento, Cal. ....	SE.	SE.	S.	S.	SW.	S.	S.	S.	S.	S.	N.	SE.
San Francisco, Cal. ....	N.	W.	W.	W.	W.	SW.	SW.	SW.	SW.	SW.	NW.	N.
<b>South Pacific Coast:</b>												
Los Angeles, Cal. ....	NE.	NE.	W.	W.	W.	W.	W.	W.	W.	W.	NE.	NE.
San Diego, Cal. ....	NE.	NW.	W.	W.	W.	W.	W.	W.	NW.	NW.	NW.	NE.
<b>Alaska Stations:</b>												
Saint Michael's, Fort, Alaska. ....	NE.	NE.	NE.	NE.	N.	N.	S.	S.	N.	NE.	NE.	NE.
Sitka, Alaska. ....	E.	E.	E.	E.	E.	SW.	W.	SW.	E.	E.	E.	E.
Unalashka, Alaska. ....	SE.	SE.	SE.	SE.	SW.	SE.	SW.	SW.	SW.	SW.	SW.	SE.



## APPENDIX 52.

*Meteorological summary for the year ending December 31, 1884.*

ALBANY, N. Y.

Location of office on December 31, 1884, United States custom-house.

[Latitude, 42° 30' N.; longitude, 73° 45' W. Elevation of barometer above sea-level, 83 feet. Elevation of exposed thermometer above ground, 80 feet. Elevation of rain-gauge above ground, 100 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
	Washington time.					Monthly mean.	Highest.	Date.	Lowest.	Range.	Washington time.			Self-registering thermometers.						Total amount.	Any 3 consecutive 8-hourly measurements.	Maximum hourly velocity during month.			Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	7 A. M.	3 P. M.	11 P. M.	7 A. M.	3 P. M.						11 P. M.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.			Date.	In.	In.			Date.	Miles.	Direction from—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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§ December.

† August.

‡ January.



*Meteorological summary for the year ending December 31, 1884—Continued.*

ALPENA, MICH.

Location of office on December 31, 1884, Fletcher and Dock streets.

[Latitude, 45° 5' N.; longitude, 83° 30' W. Elevation of barometer above sea-level, 609 feet. Elevation of exposed thermometer above ground, 55 feet. Elevation of rain-gauge above ground, 52 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.			Wind.			Total movement									
	Washington time.			Monthly mean.			Highest.			Washington time.			Self-registering thermometers.			Any 8 consecutive 8-hourly measurements.			Maximum hourly velocity during month.			Prevailing direction.										
	3 p. m.		11 p. m.	In.		Jn.	Date.		Lowest.	Date.	Range.	7 a. m.		3 p. m.	11 p. m.	Monthly mean.	Maximum.		Date.	Minimum.	Date.			Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.			In.	In.	In.	In.	In.	In.	In.	In.	
1884.																																
Jan.	29.869	29.838	29.374	29.359	29.037	26.28	579	2	1.458	10.0	16.7	11.8	12.7	14.0	5.30	—	25	60.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Feb.	29.856	29.823	29.351	29.347	29.004	20.28	604	19	1.220	10.5	19.5	14.0	15.2	28.8	0.21	—	17	29	55.0	22.6	7.2	2.760	1.00	4.5	88	W.	8	W.	8	W.	7,474	
Mar.	29.852	29.827	29.354	29.351	29.011	20.28	648	11	1.133	17.7	20.1	22.8	23.2	25.4	0.19	—	19	2	73.0	32.8	14.6	1.610	0.87	25	26	33	SW.	12	NW.	12	NW.	6,788
Apr.	29.818	29.793	29.296	29.300	29.005	21.28	539	15	1.896	32.9	42.5	37.5	37.8	36.5	0.23	20.5	6	44.5	40.5	30.5	15	16	35	15	16	35	SE.	37	NW.	17	NW.	7,505
May	29.290	29.249	29.264	29.238	29.088	20.28	857	19	1.829	45.8	53.0	47.2	48.5	50.3	0.23	30.3	8	50.1	57.8	40.7	4.5	84	W.	15	16	35	SE.	15	SE.	15	SE.	6,765
June	29.442	29.412	29.405	29.420	29.811	14.20	885	24	.726	60.5	64.7	56.3	61.5	55.0	0.30	40.0	11	45.0	70.9	52.9	2.671	1.10	23	24	23	SE.	23	SE.	23	SE.	4,563	
July	29.222	29.200	29.221	29.214	29.475	8.28	842	5	.633	58.2	67.2	58.4	61.8	63.0	0.1	45.0	14	38.0	70.8	52.9	2.380	0.85	30	31	30	W.	5	W.	5	W.	5,969	
Aug.	29.327	29.304	29.319	29.317	29.715	9.28	894	30	.821	58.1	68.0	60.0	62.0	61.2	0.20	32.0	9	52.2	70.4	53.3	2.061	1.88	29	30	24	SE.	21	W.	21	W.	5,975	
Sept.	29.331	29.293	29.322	29.316	29.859	13.28	704	24	1.135	55.9	67.4	58.8	60.5	59.0	0.0	35.0	23	53.0	70.6	51.6	4.892	0.36	28	28	48	W.	10	W.	10	W.	6,291	
Oct.	29.866	29.847	29.368	29.368	29.888	14.28	021	6	.965	45.0	53.9	45.9	45.8	54.0	0.3	20.9	24	63.1	65.6	40.0	3.751	1.06	2	35	SE.	2	W.	2	W.	7,769		
Nov.	29.813	29.278	29.316	29.302	29.655	18.28	486	23	1.160	29.8	35.4	30.4	31.7	34.0	0.14	10.1	24	47.9	38.8	23.2	2.151	1.11	23	23	31	SW.	23	W.	23	W.	6,981	
Dec.	29.823	29.314	29.345	29.337	29.926	25.28	663	6	1.943	22.6	26.0	21.6	21.2	26.1	0.31	—	10.0	19	60.1	26.4	16.4	5.581	1.06	6	29	SW.	6	W.	6	W.	6,103	
Same.	352.013	351.085	351.926	351.879	351.879	351.879	351.879	351.879	351.879	351.879	351.879	351.879	351.879	351.879	351.879	351.879	351.879	351.879	351.879	351.879	351.879	351.879	351.879	351.879	351.879	351.879	351.879	351.879	351.879	351.879	351.879	351.879
Means.	29.834	29.307	29.328	29.323	29.323	29.323	29.323	29.323	29.323	29.323	29.323	29.323	29.323	29.323	29.323	29.323	29.323	29.323	29.323	29.323	29.323	29.323	29.323	29.323	29.323	29.323	29.323	29.323	29.323	29.323	29.323	29.323

\* November.

† September.

‡ January.

## ALPENA, MICH.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.						Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—							
	North. Northeast. East. Southeast. South. Southwest. West. Northwest.									Washington time. 7 a. m. 3 p. m. 11 p. m. Mean.						Mean.				Clear. Fair. Cloudy.				On which .01 inch or more precipitation fell. Maximum below 32°. Minimum below 32°. Maximum above 32°. Thunder-storms. Aurora.							
1884.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell. Maximum below 32°. Minimum below 32°. Maximum above 32°. Thunder-storms. Aurora.							
Jan.....	5	6	6	9	0	12	13	6	0	4	3	8	9	11	15	24	15	17	17	36	31	0	0	0							
Feb.....	6	6	6	9	0	12	13	6	0	4	3	8	9	11	15	24	15	17	17	36	31	0	0	0							
Mar.....	6	6	6	9	0	12	13	6	0	4	3	8	9	11	15	24	15	17	17	36	31	0	0	0							
Apr.....	6	6	6	9	0	12	13	6	0	4	3	8	9	11	15	24	15	17	17	36	31	0	0	0							
May.....	6	6	6	9	0	12	13	6	0	4	3	8	9	11	15	24	15	17	17	36	31	0	0	0							
June.....	6	6	6	9	0	12	13	6	0	4	3	8	9	11	15	24	15	17	17	36	31	0	0	0							
July.....	6	6	6	9	0	12	13	6	0	4	3	8	9	11	15	24	15	17	17	36	31	0	0	0							
Aug.....	6	6	6	9	0	12	13	6	0	4	3	8	9	11	15	24	15	17	17	36	31	0	0	0							
Sept.....	6	6	6	9	0	12	13	6	0	4	3	8	9	11	15	24	15	17	17	36	31	0	0	0							
Oct.....	6	6	6	9	0	12	13	6	0	4	3	8	9	11	15	24	15	17	17	36	31	0	0	0							
Nov.....	6	6	6	9	0	12	13	6	0	4	3	8	9	11	15	24	15	17	17	36	31	0	0	0							
Dec.....	6	6	6	9	0	12	13	6	0	4	3	8	9	11	15	24	15	17	17	36	31	0	0	0							
Sums ..	51	47	92	182	94	101	318	178	40	381.1	400.7	387.2	389.7	387.4	782.1	940.7	900.4	67.7	67.7	56.8	64.0	90	161	115	171	87	161	2	24	15	
Percentages.																															
Means .	4.0	4.3	8.4	16.6	8.6	9.2	26.0	15.2	2.6	31.8	33.4	32.3	32.5	30.6	66.1	78.4	75.0	5.6	5.6	4.7	5.8	24.6	44.0	31.4	46.7	23.8	44.0	0.5	0.4	1.1	

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.34 a. m., 2.34 p. m., and 10.34 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.006 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.710; February, 0.710; March, 0.700; April, 0.690; May, 0.680; June, 0.650; July, 0.640; August, 0.640; September, 0.650; October, 0.670; November, 0.700; December, 0.710.

REMARKS.—September 19, about 2.40 p. m., a slight earthquake shock was felt in the western part of this city. Shock lasted about 2 seconds. Vibration, SW. to NW. JAMES J. FITZGERALD, *Sergeant, Signal Corps, U. S. A.*

*Meteorological summary for the year ending December 31, 1884—Continued.*

APACHE, FORT, ARIZ.

Location of office on December 31, 1884, post quarters.

[Latitude, 29° 49' N.; longitude, 109° 37' W. Elevation of barometer above sea-level, 5,050 (B.) feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	Washington time.					Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.					Self-registering thermometers.					Any 3 consecutive 8 hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.							Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.		Date.	Miles.	Direction.	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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§December.

‡July.

†February.

\*January.



## APACHE, FORT, ARIZ.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).		Number of days—										
	North. Northeast. East. Southeast. South. Southwest. West. Northwest. Number of calms.								7 a. m. 3 p. m. 11 p. m. Mean.				7 a. m. 3 p. m. 11 p. m. Mean.				Clear. Fair. Cloudy. On which .01 inch or more precipitation fell. Maximum below 32°. Minimum below 32°. Maximum above 80°. Thunder-storms. Aurora.				Percentages.								
1884.																													
Jan.	2	22	28	15	23	23	22	1	0	19.1	27.3	24.6	23.7	77.2	50.5	70.0	65.9	3.6	4.9	2.7	8.7	14	12	5	0	0	0	0	
Feb.	3	18	19	10	17	15	14	0	0	26.7	32.4	31.3	30.1	80.8	58.9	72.7	70.1	4.8	5.5	4.8	5.0	14	4	11	0	0	0	0	
Mar.	1	13	18	10	1	32	15	0	0	29.1	36.1	34.3	33.2	82.4	58.8	76.1	71.8	5.0	6.1	4.2	5.1	9	12	10	0	0	0	0	
Apr.	0	12	25	5	2	26	7	0	0	29.7	30.8	31.6	30.7	81.3	34.0	57.8	57.7	3.7	5.5	2.5	8.8	13	12	5	0	0	0	0	
May	1	15	25	2	2	20	6	0	1	34.1	35.7	33.1	36.0	76.2	33.1	54.7	54.7	2.8	3.3	1.7	2.5	2	10	9	0	0	0	0	
June	0	11	31	5	5	27	8	0	1	38.8	41.1	43.6	41.5	74.8	28.7	49.1	50.7	2.4	3.3	2.4	2.7	19	9	12	0	0	0	0	
July	0	12	34	10	4	18	10	0	0	48.8	44.6	48.9	47.8	69.9	22.1	42.1	44.9	2.5	2.5	2.7	2.9	19	1	1	0	0	0	0	
Aug.	0	13	24	12	9	22	6	0	0	50.5	50.8	54.5	51.8	81.1	33.4	68.1	62.5	4.0	2.1	4.0	5.0	7	20	11	0	0	0	0	
Sept.	3	18	20	9	7	21	10	2	0	44.5	46.8	48.2	46.4	84.4	30.7	68.9	64.7	2.6	3.2	2.3	2.8	18	9	3	0	0	0	0	
Oct.	2	23	17	13	6	20	7	2	1	42.2	42.6	43.0	43.0	84.4	30.2	68.7	62.1	2.8	3.6	2.6	3.3	17	9	4	0	0	0	0	
Nov.	2	24	27	6	6	18	3	0	2	27.5	31.1	29.8	29.8	86.4	26.2	63.7	62.1	1.1	2.0	1.1	1.7	22	7	1	0	0	0	0	
Dec.	3	27	16	10	5	19	8	0	5	31.6	24.5	23.7	23.7	87.4	62.1	76.1	75.2	4.2	3.0	3.9	4.4	14	7	10	0	0	0	0	
Sums	21	210	278	107	53	204	86	29	11	413.1	443.3	453.8	438.6	966.8	497.3	770.3	744.9	38.9	54.5	34.9	43.0	187	120	59	100	3	130	38	40
															Percentages.														
Means	1.9	19.9	25.3	9.7	4.6	20.8	7.8	2.6	1.0	34.4	37.4	37.8	36.5	80.6	41.4	64.2	62.1	3.3	4.5	2.9	3.6	51.1	32.8	16.1	27.3	0.8	35.6	10.4	9.0
															Percentages.														

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.48 a. m., 12.48 p. m., and 8.48 p. m., local time.

Correction for instrumental error of barometer used: From 4.48 a. m., January 1, to 8.48 p. m., December 31, 1884, inclusive, +.008 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January 5.120; February 5.100; March 5.020; April 4.920; May 4.820; June 4.750; July 4.740; August 4.720; September 4.800; October 4.900; November 5.100; December 5.060.

W. S. MAYERS,

Friedla, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

ASSINABOINE, FORT, MONT.

Location of office on December 31, 1884, post quarters.

Latitude, 49° 32' N.; longitude, 109° 42' W. Elevation of barometer above sea-level, 2,720 (B.) feet. Elevation of exposed thermometer above ground, 14 feet. Elevation of rain-gauge above ground, 4 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.			Wind.			Total movement.					
	Washington time.			Monthly mean.			Highest.			Lowest.			Self-registering thermometers.			Mean maximum.			Any 3 consecutive hourly measurements.			Maximum hourly velocity during month.						
	7 p. m.	3 p. m.	11 p. m.	7 p. m.	3 p. m.	11 p. m.	Month.	Date.	Range.	7 p. m.	3 p. m.	11 p. m.	Maximum.	Date.	Minimum.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Large amount.	Date.	Miles.		Direction from.	Date.	Prevailing direction.		
1884.																												
Jan	27.220	27.224	27.208	27.217	27.087	4	28.745	31.043	1.843	9.9	15.8	13.7	12.1	142.0	0	0	0	0	1.8	.04	16	5.48	SW.	12	SW.	8,886		
Feb	27.186	27.198	27.191	27.192	27.077	26	28.437	17.124	0.5	8.6	3.8	3.8	3.2	141.8	0	11	76.8	12.2	-1.2	.17	19	10.40	SW.	24	SW.	7,067		
Mar	27.061	27.062	27.077	27.060	27.081	6	28.614	10.767	10.5	27.3	23.7	23.7	22.5	166.6	28	-35.8	7	82.4	36.4	.53	17	10.40	NW.	10	SW.	9,148		
Apr	27.151	27.138	27.143	27.144	27.090	18	28.683	12.916	33.1	43.0	41.3	41.1	41.2	172.8	28	15.7	6	87.1	54.0	.25	15	16,273	NW, E, W.	25	SW.	9,438		
May	27.144	27.126	27.116	27.129	27.446	29	28.706	8.742	47.5	65.1	58.4	57.0	98.1	1	35	32.0	2.4	54.1	71.1	3.05	1.06	28	28.38	W.	24	NW.	9,809	
June	27.100	27.083	27.070	27.084	27.300	30	28.914	14.395	57.6	72.0	66.3	65.8	98.6	1	19	46.5	16	52.1	73.0	4.72	1.17	13	27.28	W, NW.	24	NW.	7,260	
July	27.148	27.118	27.120	27.120	27.318	12	28.823	31.495	54.7	71.3	63.7	63.9	98.0	6	43.0	6	48.0	76.9	92.9	9.07	.27	16	10.53	SE.	19	NW.	7,890	
Aug	27.176	27.158	27.149	27.161	27.405	22	28.820	1.585	54.0	73.7	68.3	64.7	97.4	10	43.1	19	51.3	80.4	61.0	2.61	.27	1	1.43	SE.	37	NW.	5,543	
Sept	27.085	27.073	27.079	27.079	27.400	19	28.762	27.648	43.8	54.6	50.3	50.3	97.2	1	25.0	30	52.2	61.5	40.6	2.69	.82	4	3.60	NW.	3	NW.	6,773	
Oct	27.116	27.099	27.124	27.113	27.610	1	28.761	1.849	33.6	54.4	46.1	46.4	103.0	13	13.8	27	66.2	56.3	33.7	.41	.19	1	1.26	NW.	13	W.	9,647	
Nov	27.227	27.224	27.224	27.225	27.406	15	28.816	26.680	31.1	44.0	37.6	37.6	668.1	6.7	-12.8	23	80.0	48.1	23.7	.42	.29	20	21.48	NW.	20	SW.	8,340	
Dec	27.226	27.215	27.231	27.224	27.030	9	28.731	3.890	-0.1	7.2	3.4	3.4	8.6	8.8	1	-50.0	25	113.8	11.2	-7.9	.73	.13	13	13.42	SW.	8,9	SW.	8,440
Sums	225.862	225.788	225.735	225.777	225.777	119	225.777	225.777	225.777	225.777	225.777	225.777	225.777	225.777	225.777	225.777	225.777	225.777	225.777	225.777	225.777	225.777	225.777	225.777	225.777	225.777		
Means.	27.155	27.145	27.144	27.143	27.087	4	28.487	117	7.63	52.2	45.2	38.7	39.1	108.6	110	-50.0	52.5	67.3	50.9	27.2	...	...	...	...	SW.	...		

January. February. June. December.

§ December.

‡ June.

† February.

\* January.

## ASSINABOINE, FORT, MONT.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
	North.		Northeast.		East.		Southeast.		South.		Southwest.		West.		Northwest.		Number of calms.		Washington time.				Clear.		Fair.		Cloudy.		On which .01 inch or more precipitation fell.		Maximum below 32°.		Minimum below 32°.		Maximum above 90°.		Thunder-storms.		Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
																			7 a. m.		8 p. m.		11 p. m.		Mean.		7 a. m.		8 p. m.		11 p. m.		Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
1884.	10	6	11	0	0	43	5	15	3	8.6	9.4	6.8	6.6	75.0	74.2	75.3	4.2	4.1	3.7	4.0	10	19	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.49 a. m., 12.49 p. m., and 8.49 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.013.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 3.05; February, 3.05; March, 3.02; April, 2.91; May, 2.85; June, 2.80; July, 2.74; August, 2.76; September, 2.86; October, 2.86; November, 2.99; December, 3.04.

REMARKS. March. Lunar halos, 8, 9; solar bands, 10; aurora, 28. April. Last frost of season, 18; last snowfall, 27. May. Thunder-storms, 16, 27; infrequent telegraph line. June. Thunder-storms, 4, 5, 10, 11, 13, 27, 28; hailstones an inch in diameter fell on the 13, 28. July. Thunder-storms, 7, 11, 15, 19, 24, 26, 27, 29; hailstone half an inch in diameter, 7; heavy monthly rainfall, August. Thunder-storms, 14, 21, 26; rapid changes of temperature, 26. September. First frost of season, 7; much sun, 7; thunder-storm, 14. October. First snowfall, 3; unusually high temperature, highest wind velocity ever observed at this station, 13; extensive prairie fires, 12, 13; not withering winds, November. High temperature; prairie fire, 7. December. Mercury frozen, 22, 24, 25.

J. J. O'CONNOR.

Private, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

ATLANTA, GA.

Location of office on December 31, 1884, United States custom-house, corner Marietta and Forsyth streets.

[Latitude, 33° 45' N.; longitude, 84° 23' W. Elevation of barometer above sea-level, 1,129 feet. Elevation of exposed thermometer above ground, 57 feet. Elevation of rain-gauge above ground, 74 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).						Temperature.						Precipitation.				Wind.		
	Washington time.			Highest.	Lowest.	Range.	Washington time.			Self-registering thermometers.			Total amount.	Any 3 consecutive 8-hourly measurements.	Date.	Direction.	Maximum hourly velocity during month.	Date.	Prevailing direction.
	7 a. m.	3 p. m.	11 p. m.				7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Absolute range.	Mean maximum.	Mean minimum.	Miles.	Miles.		
1884.	In.	In.	In.	In.	In.	In.	°	°	°	°	°	°	In.	In.	In.	SE.	7	NW.	Miles.
Jan.....	29.026	28.998	29.027	29.016	28.436	.582	30.9	41.3	34.9	35.7	64.0	31	-1.3	6	65.8	44.8	18	27	8,745
Feb.....	29.945	28.908	29.927	29.240	28.444	.796	45.3	56.7	50.9	51.0	73.0	10	11.0	29	62.0	60.3	16	27	7,711
Mar.....	28.889	28.865	28.887	28.890	28.223	.667	48.9	59.9	53.8	54.3	76.5	28	24.5	1	52.0	62.8	14	1	8,544
Apr.....	28.813	28.780	28.807	28.800	28.467	.333	52.5	64.3	57.5	58.1	82.3	30	35.0	9	47.8	66.5	15	2	7,866
May.....	28.868	28.826	28.849	28.848	28.070	.778	64.0	77.6	70.4	70.9	85.0	32	55.0	31	30.0	73.1	14	6	6,243
June.....	28.896	28.857	28.877	28.877	28.574	.303	66.8	75.8	70.8	70.8	89.0	20	87.0	1	32.0	78.1	23	9	6,038
July.....	28.852	28.811	28.835	28.833	28.061	.772	73.0	83.8	77.8	78.0	90.4	24	65.4	7	28.0	85.1	14	6	5,486
Aug.....	28.941	28.892	28.924	28.919	28.714	.205	60.4	81.8	74.5	75.1	89.0	27	60.0	6	28.0	83.1	9	3	4,989
Sept.....	28.967	28.928	28.967	28.961	28.791	.176	67.3	82.7	74.8	74.9	97.5	21	52.2	15	35.3	83.6	22	14	5,673
Oct.....	28.025	28.967	28.967	28.966	28.775	.191	60.5	75.9	67.0	67.9	80.8	3	38.6	24	57.2	77.1	23	23	6,443
Nov.....	28.974	28.929	28.965	28.945	28.841	.104	44.5	50.4	50.9	51.6	70.0	2	30.4	25	39.6	60.6	24	27	6,492
Dec.....	28.989	28.947	28.986	28.974	28.512	.467	40.3	50.3	44.6	45.5	64.5	22	11.0	19	55.5	52.5	18	18	8,123
Suma	247,205	245,708	247,046	246,966	238,841	82.5	664.0	808.0	727.4	733.2	833.1	13	530.2	833.1	634.8	82.8	.....	.....	.....
Means	28.834	28.892	28.921	28.916	28.436	.457	55.8	67.8	60.6	61.1	80.8	13	-1.3	6	44.2	69.4	.....	.....	.....

\* January.

† November.

‡ October.

## ATLANTA, GA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—							Dew-point.				Relative humidity (per cent.).		Cloudiness (in tenths).				Number of days—							
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Part.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunder-storms.	Auroras.
Washington time.																									
Percentages.																									
1884.																									
Jan.....	4	1	9	10	6	15	37	0	25.6	24.9	24.9	24.4	81.2	58.6	73.0	70.9	8	11	13	15	4	16	0	1	0
Feb.....	4	1	5	10	16	19	22	0	34.5	37.9	33.2	37.5	72.0	53.1	61.0	63.0	14	10	6	5	4	5	0	5	0
Mar.....	9	2	8	16	11	17	23	0	40.8	41.7	41.2	41.8	75.2	54.1	66.2	63.8	11	10	10	16	0	4	0	5	0
Apr.....	4	1	9	13	2	11	33	0	42.4	40.1	42.6	41.8	70.4	48.7	60.6	59.3	4	8	10	18	0	4	0	0	0
May.....	2	1	12	10	6	7	26	0	55.0	53.5	55.6	54.7	71.7	45.9	60.6	59.4	4	13	14	4	0	0	0	0	0
June.....	2	11	29	23	6	5	10	4	61.2	61.0	62.2	61.5	83.1	65.0	77.4	75.2	6	16	16	21	0	0	0	0	0
July.....	7	5	2	2	5	27	32	13	67.0	65.7	68.8	67.0	82.7	57.1	73.8	71.2	10	11	8	6	0	0	0	0	0
Aug.....	4	19	21	11	4	4	11	18	64.6	63.0	65.0	64.2	84.8	55.2	73.1	71.0	19	8	0	10	0	0	0	0	0
Sept.....	8	14	19	25	13	8	4	9	60.1	57.6	60.2	59.3	78.3	43.7	61.3	61.1	19	11	0	3	0	0	0	0	0
Oct.....	3	7	27	16	5	1	21	0	52.9	54.2	53.5	53.6	76.7	49.5	63.0	63.1	7	8	4	2	0	0	0	0	0
Nov.....	6	8	15	6	3	5	18	31	35.4	34.6	33.5	35.2	71.1	42.9	57.6	57.2	16	0	0	9	0	0	0	0	0
Dec.....	2	29	11	9	2	8	27	0	34.5	36.4	36.8	35.9	60.7	62.7	75.9	73.1	6	16	5	12	1	2	0	1	0
Sums ..	53	67	180	152	82	116	180	267	576.0	572.4	568.2	573.2	927.9	638.5	806.7	790.3	149	134	83	134	5	37	3	45	0
Means ..	4.8	6.1	116.4	112.8	7.5	10.6	616.4	424.3	48.0	47.7	48.3	48.2	77.3	53.0	67.2	65.8	4.3	40.7	36.6	36.6	1.4	10.1	0.8	12.3	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.31 a. m., 2.31 p. m., and 10.31 p. m., local time.

Correction for instrumental error of barometer used: From 6.31 a. m., January 1, to 10.31 p. m., December 31, 1884, inclusive, +.005 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.230; February, 1.220; March, 1.210; April, 1.190; May, 1.170; June, 1.160; July, 1.150; August, 1.130; September, 1.110; October, 1.090; November, 1.220; December, 1.230.

REMARKS.—The lowest temperature, —1° 3, occurred January 6. Very destructive cyclone crossed the State February 13. Highest wind, 44 miles, on March 1. Destructive rain with hail April 14 and 15. Last frost of the season April 11. Greatest monthly rainfall in June, 10.73 inches. Severe drought in August, September, and October—73 days after August 9 without rain. Highest temperature, 90° 8, October 3. First light frost October 24. First killing frost November 6. Greatest daily rainfall, 3.74 inches, December 14. Heavy sleet December 21.

S. W. BEALL,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

ATLANTIC CITY, N. J.

Location of office on December 31, 1884, No. 10 Rhode Island avenue.

[Latitude, 39° 22' N.; longitude, 74° 25' W. Elevation of barometer above sea-level, 13 feet. Elevation of exposed thermometer above ground, 10 feet. Elevation of rain-gauge above ground, 37 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.			Wind.				Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	Washington time.			Monthly mean.	Highest.	Lowest.	Range.	Washington time.			Self-registering thermometers.			Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.	Largest amount.	Date.	Miles.	Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
	7 p. m.	3 p. m.	11 p. m.					7 p. m.	8 p. m.	11 p. m.	Monthy mean.	Maximum.	Date.								Minimum.	Date.			Absolute range.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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\* January.

† April.

‡ July.

§ December.

## ATLANTIC CITY, N. J.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m. Washington time: Number of times observed blowing from—								Dew-point.	Relative humidity (per cent.).	Cloudiness (in tenths).					Number of days—									
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.			Washington time.					Clear.	Part.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunder-storms.	Aurora.	
											7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.										8 p. m.
1884.																									
Jan.....	18	15	5	2	8	19	14	16	1	20.4	22.3	76.8	76.9	74.0	75.9	6.6	7.8	6	15	15	9	29	0	0	0
Feb.....	9	14	24	4	6	13	8	9	0	32.2	31.8	83.1	80.6	84.0	83.2	5.7	4.7	8	18	18	1	13	0	0	0
Mar.....	15	9	11	8	10	11	18	7	0	31.8	33.2	83.7	78.8	84.4	82.6	5.6	7.5	14	11	18	3	16	0	0	0
Apr.....	15	2	17	9	5	4	17	18	0	37.9	38.6	77.8	69.0	79.4	75.4	4.2	6.4	11	6	16	3	1	0	0	0
May.....	7	7	16	13	17	13	8	5	0	50.0	49.5	79.2	65.5	80.9	75.2	5.0	4.8	11	12	6	0	0	0	0	0
June.....	3	15	15	13	11	4	4	10	0	60.0	61.7	83.4	75.3	86.5	81.7	2.8	3.4	18	9	11	0	0	0	0	0
July.....	2	4	16	11	21	22	14	3	0	62.2	63.5	83.7	63.1	86.5	79.0	5.8	4.3	11	11	5	0	0	0	0	0
Aug.....	2	1	15	11	14	12	3	2	0	65.2	64.7	83.0	76.4	88.6	83.9	5.2	3.8	11	11	10	0	0	0	0	0
Sept.....	3	10	10	4	15	20	6	0	0	61.8	64.4	83.0	71.5	85.7	80.1	3.0	2.2	23	6	1	0	0	0	0	0
Oct.....	11	13	3	3	12	20	10	21	0	49.1	51.1	79.6	64.7	81.6	78.0	3.9	3.0	13	12	6	0	0	0	0	0
Nov.....	8	9	10	4	7	17	16	17	2	34.5	41.2	84.9	71.1	84.4	80.1	3.7	4.2	17	6	7	0	0	0	0	0
Dec.....	12	12	7	2	6	16	17	20	1	30.4	32.8	84.1	79.8	85.0	83.0	5.1	5.4	10	12	3	14	0	1	0	0
Sums ..	118	131	131	92	118	200	189	148	23	536.5	567.7	864.3	881.2	1000.9	965.5	55.6	60.8	186	131	16	72	0	7	0	0
Percentages.																									
Means .	10.5	11.9	11.9	8.4	10.7	18.2	11.8	13.5	3.0	44.7	47.3	82.0	73.4	83.4	79.6	4.6	5.1	37.2	27.0	35.8	4.4	19.7	0.19	0	0

NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond to 7.11 a. m., 3.11 p. m., and 11.11 p. m., local time.

Correction for instrumental error of barometer used: From 7.11 a. m., January 1, to December 31, 1884, inclusive, —.003 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.01; February, 0.01; March, 0.01; April, 0.01; May, 0.01; June, 0.01; July, 0.01; August, 0.01; September, 0.01; October, 0.01; November, 0.01; December, 0.01.

REMARKS.—August 10, 2.07 p. m., three light shocks of earthquake were felt in this city which were of about three seconds duration, appeared to be from NE to SW.

B. A. BLUNDON,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

AUGUSTA, GA.

Location of office on December 31, 1884, Cotton Exchange Building, Reynolds street.

[Latitude, 32° 28' N.; longitude, 81° 54' W. Elevation of barometer above sea-level, 153 feet. Elevation of exposed thermometer above ground, 19 feet. Elevation of rain-gauge above ground, 89 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.			Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	Washington time.			Monthly mean.	Higheest.	Date.	Lowest.	Range.	Washington time.			Self-registering thermometer.			Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.	Maximum hourly velocity during month.			Prevailing direction.	Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	7 p. m.	9 p. m.	11 p. m.						7 a. m.	9 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.					Minimum.	Date.	Absolute range.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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Jan.....	30.077	30.024	30.067	30.056	30.529	27	29.468	8	1.061	37.4	50.3	42.6	43.4	68.0	31	14.0	6	54.0	52.3	34.6	4.34	1.63	7.8	20	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.	2	W.</

1 One 7 a. m. observation missed.  
2 One 7 a. m. and one 11 p. m. observation missed; does not include maximum and minimum and range.

3 Three 7 a. m. observations missed.  
4 Two 7 a. m. observations missed.  
5 January.

6 November.  
7 July.



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[illegible]

One 7 a. m. observation missed. <sup>2</sup> One 7 a. m. and one 11 p. m. observation missed; does not include maximum and minimum and range. <sup>3</sup> Three 7 a. m. observations missed. <sup>4</sup> Two 7 a. m. observations missed. <sup>5</sup> Percentage of 366 days. <sup>6</sup> April. <sup>7</sup> October.

October:

clusive, —.004 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.200; February, 0.200; March, 0.200; April, 0.190; May, 0.190; June, 0.190; July, 0.190; August, 0.190; September, 0.190; October, 0.190; November, 0.200; December, 0.200.

REMARKS.—Last frost of spring April 10; first light frost of autumn October 25. No changes have been made in the elevation of the instruments during the year.

*Meteorological summary for the year ending December 31, 1884—Continued.*

APACHE, FORT, ARIZ.

Location of office on December 31, 1884, post quarters.

[Latitude, 28° 49' N.; longitude, 109° 57' W. Elevation of barometer above sea-level, 5,050 (B.) feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
	Washington time.					Monthly mean.					Highest.			Lowest.			Date.			Range.			Washington time.				Self-registering thermometers.					Mean maximum.		Mean minimum.		Total amount.		Any 3 consecutive 8 hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	7 a. m.		5 p. m.		11 p. m.	7 a. m.		5 p. m.		11 p. m.	Monthly mean.		Maximum.		Date.		Minimum.		Date.		Absolute range.		Mean maximum.		Mean minimum.		Total amount.		Any 3 consecutive 8 hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	In.	W.	In.	W.	In.	In.	W.	In.	W.	In.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.		W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.

§December.

‡July.

†February.

\*January.

## APACHE, FORT, ARIZ.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Washington time.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
										7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.48 a. m., 12.48 p. m., and 8.48 p. m., local time.  
 Correction for instrumental error of barometer used: From 4.48 a. m., January 1, to 8.48 p. m., December 31, 1884, inclusive, +.003 inch.  
 The barometric observations may be reduced to sea level by adding the following constants for the various months: January, 5.120; February, 5.100; March, 5.020;  
 April, 4.920; May, 4.820; June, 4.750; July, 4.740; August, 4.720; September, 4.800; October, 4.900; November, 5.100; December, 5.060.

W. S. MAYERS

Private, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

ASSINABOINE, FORT, MONT.

Location of office on December 31, 1884, post quarters.

[Latitude, 49° 22' N.; longitude, 109° 42' W. Elevation of barometer above sea-level, 2,720 (B.) feet. Elevation of exposed thermometer above ground, 14 feet. Elevation of rain-gauge above ground, 4 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.			Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	Washington time.					Monthly mean.					Washington time.			Self-registering ther- mometers.			Any 3 con- secutive 8-hourly measure- ments.			Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	7 p. m.		3 p. m.		11 p. m.	7 a. m.		3 p. m.		11 p. m.	Monthly mean.		Maximum.		Date.		Minimum.		Date.		Absolute range.			Mean maximum.		Mean minimum.		Total amount.		Date.		Direction from— Miles.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	<i>Bar.</i>	<i>Ther.</i>	<i>Bar.</i>	<i>Ther.</i>	<i>Bar.</i>	<i>Ther.</i>	<i>Bar.</i>	<i>Ther.</i>	<i>Bar.</i>	<i>Ther.</i>	<i>Bar.</i>	<i>Ther.</i>	<i>Bar.</i>	<i>Ther.</i>	<i>Bar.</i>	<i>Ther.</i>	<i>Bar.</i>	<i>Ther.</i>	<i>Bar.</i>	<i>Ther.</i>	<i>Bar.</i>	<i>Ther.</i>		<i>Bar.</i>	<i>Ther.</i>	<i>Bar.</i>	<i>Ther.</i>	<i>Bar.</i>	<i>Ther.</i>	<i>Bar.</i>	<i>Ther.</i>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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§ December.

§ June.

§ February.

§ January.

## ASSINABOINE, PORT, MONT.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—									Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—										
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.
Washington time.																										

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.49 a. m., 12.49 p. m., and 8.49 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, + 0.13.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 3.05; February, 3.05; March, 3.02; April, 2.91; May, 2.85; June, 2.80; July, 2.74; August, 2.76; September, 2.86; October, 2.83; November, 2.89; December, 3.04.

REMARKS.—March. Lunar halos, 8, 9; polar bands, 10; aurora, 28. April. Last frost of season, 18; last snowfall, 27. May. Thunder-storms, 16, 27, influencing telegraph line. June. Thunder-storms, 4, 5, 10, 11, 13, 27, 28; hailstones an inch in diameter fell on the 13, 28. July. Thunder-storms, 7, 11, 15, 19, 24, 26, 27, 29; hailstones half an inch in diameter, 7; heavy monthly rainfall, August. Thunder-storms, 14, 21, 26; rapid changes of temperature, 26. September. First frost of season, 7; mock sun, 7; thunder-storm, 14. October. First snowfall, 3; unusually high temperature, highest wind velocity ever observed at this station, 13; extensive prairie fires, 12, 13; hot withering winds. November. High temperature; prairie fire, 7. December. Mercury frozen, 22, 24, 25.

J. J. O'CONNOR,  
Private, Signal Corps, U. S. A.



## ATLANTA, GA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.	Relative humidity (per cent.).	Cloudiness (in tenths).				Number of days—															
	Washington time.										Clear.				Rain.				Cloudy.		On which .01 inch or more precipitation fell.		Minimum below 32°.		Maximum below 32°.		Thunder-storms.		Aurora.	
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.			7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Rain.	Cloudy.	On which .01 inch or more precipitation fell.	Minimum below 32°.	Maximum below 32°.	Maximum above 80°.	Thunder-storms.	Aurora.			
Number of calms.																														
Percentages.																														
1884.																														
Jan.....	2	1	5	10	16	19	15	37	25.6	27.9	26.9	26.4	81.2	53.6	73.0	70.9	5.4	8	11	12	15	4	18	0	1	0	0	0	0	0
Feb.....	4	2	9	13	16	17	16	23	36.5	41.7	41.2	41.8	75.2	53.1	66.2	63.0	4.2	14	10	10	16	0	5	0	2	0	0	0	0	0
Mar.....	3	1	9	13	12	11	17	23	40.8	41.7	41.2	41.8	75.2	48.7	60.9	59.8	5.7	11	10	10	16	0	4	0	4	0	0	0	0	0
Apr.....	4	1	12	10	6	7	26	20	55.0	53.5	55.6	54.7	71.7	45.9	60.6	59.4	4.3	13	4	12	16	0	0	0	0	0	0	0	0	0
May.....	2	1	29	23	6	5	10	4	61.2	61.0	62.2	61.5	83.1	65.0	77.4	75.2	0.6	13	14	4	6	0	0	0	0	0	0	0	0	0
June.....	7	5	2	2	5	27	32	13	67.0	63.7	63.8	67.0	82.7	57.1	73.8	71.2	4.1	16	8	16	21	0	0	0	0	0	0	0	0	0
July.....	4	19	21	11	4	4	11	18	64.6	63.0	63.0	64.2	84.8	55.2	73.1	71.0	3.2	19	8	10	6	0	0	0	0	0	0	0	0	0
Aug.....	3	14	19	25	13	3	4	9	60.1	57.6	63.2	59.3	78.3	43.7	61.3	61.1	2.0	19	11	0	3	0	0	0	0	0	0	0	0	0
Sept.....	5	7	27	19	5	1	12	21	52.0	47.2	53.5	53.5	76.7	49.5	63.0	63.1	2.6	7	3	4	8	0	0	0	0	0	0	0	0	0
Oct.....	2	5	16	6	3	8	9	27	35.4	34.6	33.5	33.2	71.1	42.9	57.6	57.2	2.7	6	9	6	9	1	2	0	1	0	0	0	0	0
Nov.....	2	2	29	11	5	5	9	27	34.5	30.4	30.8	33.6	80.7	61.7	71.9	73.1	3.2	16	9	12	1	3	0	0	1	0	0	0	0	0
Dec.....	2	2	29	11	5	5	9	27	34.5	30.4	30.8	33.6	80.7	61.7	71.9	73.1	3.2	16	9	12	1	3	0	0	1	0	0	0	0	0
Sums ..	53	67	180	152	82	116	180	267	576.0	572.4	568.2	578.2	927.9	638.5	806.7	790.3	51.5	134	83	134	5	37	3	45	0	0	0	0	0	0
Means ..																														
4.8 6.116.413.8 7.510.616.424.3 0.1 48.0 47.7 48.8 48.2 77.3 53.0 67.2 65.8 4.3 5.0 2.7 4.3 10.1 0.812.3 0																														

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.31 a. m., 2.31 p. m., and 10.31 p. m., local time.

Correction for instrumental error of barometer used: From 0.31 a. m., January 1, to 10.31 p. m., December 31, 1884, inclusive, +.005 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.230; February, 1.220; March, 1.210; April, 1.190; May, 1.170; June, 1.150; July, 1.150; August, 1.150; September, 1.170; October, 1.190; November, 1.220; December, 1.230.

REMARKS.—The lowest temperature, -10.3, occurred January 6. Very destructive cyclone crossed the State February 19. Highest wind, 44 miles, on March 1. Damage-rain with hail April 14 and 15. Last frost of the season April 11. Greatest monthly rainfall in June, 10.73 inches. Severe drought in August, September, and October—73 days after August 9 without rain. Highest temperature, 90.8, October 3. First light frost October 24. First killing frost November 6. Greatest daily rainfall, 3.74 inches, December 14. Heavy sleet December 21.

S. W. BEALL,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

ATLANTIC CITY, N. J.

Location of office on December 31, 1884, No. 10 Rhode Island avenue.

[Latitude, 39° 22' N.; longitude, 74° 25' W. Elevation of barometer above sea-level, 18 feet. Elevation of exposed thermometer above ground, 10 feet. Elevation of rain-gauge above ground, 87 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.				Wind.				Total movement.						
	Washington time.				Monthly mean.	Highest.	Date.	Lowest.	Range.	Washington time.			Self-registering thermometers.			Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.	Maximum hourly velocity during month.		Prevailing direction.									
	7 P. M.	3 P. M.	11 P. M.	Monthly mean.						Maximum.	Date.	Minimum.	Date.	Absolute range.																	
															Date.					Direction from—	Miles.										
1884.	<i>I<sub>a</sub></i>	<i>I<sub>b</sub></i>	<i>I<sub>c</sub></i>	<i>I<sub>d</sub></i>	<i>I<sub>e</sub></i>	<i>I<sub>f</sub></i>	<i>I<sub>a</sub></i>	<i>I<sub>b</sub></i>	<i>I<sub>c</sub></i>	<i>I<sub>d</sub></i>	<i>I<sub>e</sub></i>	<i>I<sub>f</sub></i>	<i>I<sub>a</sub></i>	<i>I<sub>b</sub></i>	<i>I<sub>c</sub></i>	<i>I<sub>d</sub></i>	<i>I<sub>e</sub></i>	<i>I<sub>f</sub></i>	<i>I<sub>a</sub></i>	<i>I<sub>b</sub></i>	<i>I<sub>c</sub></i>	<i>I<sub>d</sub></i>	<i>I<sub>e</sub></i>	<i>I<sub>f</sub></i>	<i>I<sub>a</sub></i>	<i>I<sub>b</sub></i>	<i>I<sub>c</sub></i>	<i>I<sub>d</sub></i>	<i>I<sub>e</sub></i>	<i>I<sub>f</sub></i>	
Jan.....	30.113	30.091	30.105	30.108	30.099	30.107	30.107	30.107	30.107	30.107	30.107	30.107	30.107	30.107	30.107	30.107	30.107	30.107	30.107	30.107	30.107	30.107	30.107	30.107	30.107	30.107	30.107	30.107	30.107	30.107	
Feb.....	30.089	30.033	30.070	30.047	30.070	30.047	30.070	30.047	30.070	30.047	30.070	30.047	30.070	30.047	30.070	30.047	30.070	30.047	30.070	30.047	30.070	30.047	30.070	30.047	30.070	30.047	30.070	30.047	30.070	30.047	30.070
Mar.....	30.016	29.935	30.006	29.992	29.973	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047
Apr.....	30.044	30.032	30.042	30.030	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032
May.....	30.044	30.012	30.042	30.030	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032	30.032
June.....	30.068	30.033	30.046	30.055	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047	30.047
July.....	30.068	30.025	30.045	30.046	30.008	30.046	30.046	30.046	30.046	30.046	30.046	30.046	30.046	30.046	30.046	30.046	30.046	30.046	30.046	30.046	30.046	30.046	30.046	30.046	30.046	30.046	30.046	30.046	30.046	30.046	30.046
Aug.....	30.041	30.013	30.027	30.027	30.029	30.029	30.029	30.029	30.029	30.029	30.029	30.029	30.029	30.029	30.029	30.029	30.029	30.029	30.029	30.029	30.029	30.029	30.029	30.029	30.029	30.029	30.029	30.029	30.029	30.029	30.029
Sept.....	30.113	30.072	30.090	30.091	30.043	30.043	30.043	30.043	30.043	30.043	30.043	30.043	30.043	30.043	30.043	30.043	30.043	30.043	30.043	30.043	30.043	30.043	30.043	30.043	30.043	30.043	30.043	30.043	30.043	30.043	30.043
Oct.....	30.149	30.068	30.128	30.125	30.081	30.081	30.081	30.081	30.081	30.081	30.081	30.081	30.081	30.081	30.081	30.081	30.081	30.081	30.081	30.081	30.081	30.081	30.081	30.081	30.081	30.081	30.081	30.081	30.081	30.081	30.081
Nov.....	30.093	30.041	30.048	30.061	30.041	30.041	30.041	30.041	30.041	30.041	30.041	30.041	30.041	30.041	30.041	30.041	30.041	30.041	30.041	30.041	30.041	30.041	30.041	30.041	30.041	30.041	30.041	30.041	30.041	30.041	30.041
Dec.....	30.173	30.113	30.130	30.139	30.013	30.013	30.013	30.013	30.013	30.013	30.013	30.013	30.013	30.013	30.013	30.013	30.013	30.013	30.013	30.013	30.013	30.013	30.013	30.013	30.013	30.013	30.013	30.013	30.013	30.013	30.013
Sums.....	300.450	300.008	300.277	300.249	300.000	300.000	300.000	300.000	300.000	300.000	300.000	300.000	300.000	300.000	300.000	300.000	300.000	300.000	300.000	300.000	300.000	300.000	300.000	300.000	300.000	300.000	300.000	300.000	300.000	300.000	300.000
Means.....	30.089	30.001	30.072	30.071	30.000	30.000	30.000	30.000	30.000	30.000	30.000	30.000	30.000	30.000	30.000	30.000	30.000	30.000	30.000	30.000	30.000	30.000	30.000	30.000	30.000	30.000	30.000	30.000	30.000	30.000	30.000
† April.																															
‡ July.																															
§ December.																															



## ATLANTIC CITY, N. J.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.	Relative humidity (per cent.).	Cloudiness (in tenths).					Number of days—														
	Washington time.										Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Clear.	Part.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.	Thunder-storms.	Aurora.			
1884.																														
North.	North-east.	South-east.	South.	South-west.	West.	North-west.	Number of calms.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Part.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.	Thunder-storms.	Aurora.		
Jan.....	18	15	5	2	4	0	16	20.4	25.4	21.1	22.3	76.8	75.9	74.0	75.9	6.6	7.8	6.6	6.7	4	13	14	15	9	26	0	0	0		
Feb.....	19	14	24	4	0	18	7	32.2	33.8	31.8	32.6	85.1	80.6	84.0	83.2	5.7	4.7	5.6	5.6	5	16	18	18	3	16	0	0	0		
Mar.....	15	9	11	9	10	17	18	31.3	34.7	33.2	33.1	82.7	78.8	84.4	82.9	4.3	4.5	5.1	4.3	6	16	11	10	3	19	0	0	0		
Apr.....	15	2	17	9	5	14	17	37.9	40.7	38.6	39.1	77.8	68.5	79.4	75.4	4.3	4.5	5.1	4.7	11	12	8	9	0	0	0	0	0		
May.....	7	7	15	13	17	13	8	5	50.0	50.3	48.7	50.0	83.4	73.3	85.5	81.7	2.8	4.8	4.3	4.7	11	12	8	9	0	0	0	0	0	
June.....	3	15	16	13	11	4	4	10	60.0	61.7	58.5	60.4	83.4	73.3	85.5	81.7	2.8	4.8	4.3	4.7	11	12	8	9	0	0	0	0	0	
July.....	2	4	9	11	21	22	14	3	62.2	63.5	63.7	63.1	81.0	69.6	86.4	78.0	3.4	4.3	4.8	3.2	8	15	6	7	0	0	0	0	0	
Aug.....	12	21	15	11	14	12	3	2	61.3	64.4	63.1	62.9	83.0	70.4	88.6	83.9	5.2	4.3	4.8	4.8	11	6	10	10	0	0	0	0	0	
Sept.....	3	10	4	15	39	8	6	0	61.3	64.4	63.1	62.9	83.0	70.4	88.6	83.9	5.2	4.3	4.8	4.8	11	6	10	10	0	0	0	0	0	
Oct.....	11	13	3	12	20	10	21	0	42.1	51.1	50.9	51.6	74.6	66.7	81.6	76.0	2.0	2.2	2.9	23	13	6	1	3	0	0	0	0	0	
Nov.....	8	9	10	4	7	17	16	17	33.5	41.2	38.9	39.2	84.9	71.1	84.4	80.1	3.9	3.9	3.9	18	12	6	1	3	0	0	0	0	0	
Dec.....	12	12	7	2	6	16	17	20	30.4	34.2	32.8	32.5	84.1	73.3	85.0	83.0	5.1	4.3	5.6	9	10	12	12	3	14	0	0	0	0	
Sums ..	115	131	131	92	118	200	190	148	593.5	567.7	559.5	551.6	964.3	881.2	1000.9	955.5	55.6	60.8	51.5	131	136	99	131	16	72	0	7	0	0	
Percentages.																														
Means .	10.5	11.9	9.1	8.4	10.7	21.1	8.13	5.3	44.7	47.3	45.9	46.0	82.0	73.4	83.4	79.6	4.6	5.1	4.3	85.8	87.2	27.0	86.8	4.4	12.7	0.19	0	0	0	0

NOTE.—7 a. m. 3 p. m. and 11 p. m., Washington time, correspond to 7.11 a. m., 3.11 p. m. and 11.11 p. m., local time.

Correction for instrumental error of barometer used: From 7.11 a. m., January 1, to December 31, 1884, inclusive, —.003 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.01; February, 0.01; March, 0.01; April, 0.01; May, 0.01; June, 0.01; July, 0.01; August, 0.01; September, 0.01; October, 0.01; November, 0.01; December, 0.01.

REMARKS.—August 10, 2.07 p. m., three light shocks of earthquake were felt in this city which were of about three seconds duration, appeared to be from NE to SW.

B. A. BLUNDON,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

AUGUSTA, GA.

Location of office on December 31, 1884, Cotton Exchange Building, Reynolds street.

[Latitude, 32° 28' N.; longitude, 81° 54' W. Elevation of barometer above sea-level, 183 feet. Elevation of exposed thermometer above ground, 19 feet. Elevation of rain-gauge above ground, 39 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.							Precipitation.			Wind.			Total movement.						
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.				Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.	Maximum hourly velocity during month.				Prevailing direction.					
	7 p. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.					Date.	Absolute range.								
																							Miles.			Direction from—	Date.			
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	Miles.					
Jan.....	30.077	30.024	30.067	30.056	30.529	27	29.468	8	1.061	37.4	50.8	42.6	43.4	68.0	31	14.0	6	54.0	52.3	34.6	4.34	1.68	7, 8	20	W.	2	2,808			
Feb.....	29.979	29.916	29.962	29.949	30.357	16	29.401	27	.966	48.8	60.1	54.6	56.5	78.0	12	24.0	29	54.0	67.9	46.4	3.98	1.16	17	22	S.	19	2,968			
Mar.....	29.926	29.869	29.906	29.900	30.270	16	29.502	1	.768	53.2	67.0	58.7	59.5	92.0	25	27.5	1	54.5	68.8	50.5	6.97	1.57	13	22	SE.	18	3,841			
Apr.....	29.823	29.756	29.785	29.791	30.025	12	29.410	2	.635	55.4	70.6	60.4	62.1	97.8	30	40.0	10	47.8	71.7	52.4	3.68	1.83	14, 15	22	W.	21	2,801			
May.....	29.860	29.788	29.827	29.825	30.071	31	29.565	27	.506	67.8	82.5	73.6	74.0	90.0	21	54.5	31	35.5	84.0	65.0	3.21	1.09	25	24	SE.	24	3,345			
June.....	29.802	29.839	29.876	29.873	30.136	16	29.559	10	.577	66.6	80.5	71.6	74.0	92.0	21	57.5	8	34.5	82.3	67.2	4.84	1.85	24	24	NE.	21	2,929			
July <sup>1</sup> .....	29.826	29.759	29.803	29.796	30.063	23	29.617	16	.386	75.7	88.4	78.7	80.9	94.0	13	65.6	9	28.4	89.9	72.9	3.25	0.66	23, 24	24	W.	11	2,468			
Aug. <sup>2</sup> .....	29.908	29.848	29.891	29.882	30.068	19	29.626	30	.432	73.1	87.3	76.9	79.1	93.8	21	64.0	14	29.8	88.3	70.9	4.36	3.08	7	18	SE.	26	2,218			
Sept.....	29.972	29.902	29.955	29.943	30.166	14	29.684	11	.482	70.1	84.7	77.4	78.4	91.0	8	57.0	17	34.0	85.3	68.2	4.24	2.43	10, 11	22	NE.	6	2,981			
Oct. <sup>3</sup> .....	30.034	29.945	29.995	29.991	30.312	20	29.712	9	.600	63.2	80.5	68.0	70.9	93.5	6	58.0	26	55.5	81.2	60.9	0.83	0.71	10, 11	22	NE.	12	2,819			
Nov. <sup>4</sup> .....	30.000	29.922	29.970	29.964	30.268	7	29.359	28	.940	43.6	64.2	53.3	54.5	77.0	23	33.5	25	43.5	67.4	43.6	1.71	1.19	26	24	NE.	15	2,090			
Dec. <sup>4</sup> .....	30.054	29.976	30.021	30.017	30.423	27	29.585	6	.868	44.6	57.7	49.8	50.7	74.6	22	23.0	20	51.6	60.1	41.6	4.19	1.59	22	19	SW.	28	2,116			
Sum.....	350.260	353.544	358.068	358.966	.....	.....	.....	.....	8.220	764.7	882.2	760.3	782.3	.....	.....	532.1	889.3	874.2	45.10	.....	.....	.....	.....	.....	.....	.....	NE.	22	31,364	
Means.....	29.947	29.879	29.922	29.916	30.529	27	29.859	28	.695	58.7	73.5	63.4	65.2	94.0	13	44.0	9	43.6	74.9	56.2	.....	.....	.....	.....	.....	.....	.....	.....	NE.	.....

<sup>1</sup>One 7 a. m. observation missed.

<sup>2</sup>Three 7 a. m. observations missed.

<sup>3</sup>One 7 a. m. and one 11 p. m. observation missed; does not include maximum and minimum and range.

<sup>4</sup>Two 7 a. m. observations missed.

<sup>5</sup>January.

### REPORT OF THE CHIEF SIGNAL OFFICER.

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**AUGUSTA, GA.—Continued.**

[illegible]

1 One 7 a. m. observation missed. 2 One 7 a. m. and one 11 p. m. observation missed; does not include maximum and minimum and range. 3 Three 7 a. m. observations missed. 4 Two 7 a. m. observations missed. 5 Percentage of 366 days. 6 April. 7 October.

and 10.41 p. m., local time.

usive, —.004 inch.

**004 inch.**

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.200; February, 0.200; March, 0.200; April, 0.190; May, 0.190; June, 0.190; July, 0.190; August, 0.190; September, 0.190; October, 0.190; November, 0.200; December, 0.200.

REMARKS.—Last frost of spring April 10; first light frost of autumn October 16; first killing frost of autumn October 25. No changes have been made in the elevation of W. J. EVANS.

*Corporal, Signal Corps, U. S. A.*

*Meteorological summary for the year ending December 31, 1884—Continued.*

BALTIMORE, MD.

Location of office on December 31, 1884, Baltimore Fire Insurance Co.'s Office, corner South and Water streets.

[Latitude, 39° 19' N.; longitude, 76° 37' W. Elevation of barometer above sea-level, 45 feet. Elevation of exposed thermometer above ground, 33 feet. Elevation of rain-gauge above ground, 66 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.			Wind.		Total movement.				
Month.	Washington time.			Monthly mean.	Higheast.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering ther- mometers.			Mean maximum.	Mean minimum.	Total amount.			Any 3 con- secutive 8-hourly measures- ments.	Maximum hourly velocity during month.		Prevailing direction.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.			Date.	Absolute range.			Date.	Direction	
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.		
Jan.....	30.152	30.096	30.124	30.124	30.081	27.28.214	8	1.617	28.9	34.9	32.2	82.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0		
Feb.....	30.056	30.035	30.083	30.058	30.038	28.22.289	28	1.432	40.3	45.5	40.7	42.2	36.2	36.2	36.2	36.2	36.2	36.2	36.2	36.2	36.2	36.2	36.2		
Mar.....	30.030	30.072	30.029	30.030	30.038	28.22.487	26	1.951	40.5	48.5	43.1	44.0	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5		
Apr.....	29.884	29.817	29.875	29.859	29.839	28.22.179	2	1.019	43.1	58.0	50.8	52.3	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7		
May.....	29.965	29.898	29.935	29.929	29.909	28.22.014	11	0.998	60.9	71.4	62.1	64.8	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0		
June.....	30.066	30.019	30.037	30.041	30.037	28.22.072	10	0.782	68.1	80.1	70.3	72.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2		
July.....	30.078	30.014	30.035	30.039	30.037	28.22.054	13	0.443	70.9	82.3	72.0	74.7	39.8	39.8	39.8	39.8	39.8	39.8	39.8	39.8	39.8	39.8	39.8		
Aug.....	30.040	30.093	30.027	30.029	30.027	28.22.078	30	0.900	71.1	81.8	72.7	75.2	39.8	39.8	39.8	39.8	39.8	39.8	39.8	39.8	39.8	39.8	39.8		
Sept.....	30.105	30.036	30.124	30.118	30.072	28.22.704	17	0.746	65.8	80.5	70.0	72.1	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2		
Oct.....	30.151	30.079	30.124	30.118	30.072	28.22.702	8	0.870	54.8	67.5	58.9	60.2	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7		
Nov.....	30.096	30.032	30.065	30.064	30.042	28.22.456	28	0.969	41.5	52.4	45.3	48.4	37.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3		
Dec.....	30.175	30.117	30.150	30.147	30.077	28.22.491	6	1.136	33.8	41.0	37.5	37.5	36.2	36.2	36.2	36.2	36.2	36.2	36.2	36.2	36.2	36.2	36.2		
Sums.....	300.598	300.306	300.379	300.291	299.923	28.22.523.7	11	231.023.7	743.9	854.9	654.9	674.9	674.9	674.9	674.9	674.9	674.9	674.9	674.9	674.9	674.9	674.9	674.9		
Means.....	30.049	30.062	30.082	30.024	30.081	28.22.179	12	0.896	52.1	62.0	54.6	54.6	54.6	54.6	54.6	54.6	54.6	54.6	54.6	54.6	54.6	54.6	54.6		

\* January. † April. ‡ July.

## BALTIMORE, MD.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).				Number of days—									
	Number of calms.								North.		Northeast.		East.		Southeast.		South.		Southwest.		West.		Northwest.			
									North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.										
1884.	Jan.....	16	10	9	6	10	11	14	1	10.3	22.6	7 a. m.	31.7	31.5	21.5	67.0	62.5	68.2	65.9	5.7	10	15	24	0	0	0
	Feb.....	15	13	13	10	7	8	9	16	31.9	32.2	7 a. m.	31.7	32.8	31.9	72.8	70.7	71.2	68.6	4.0	12	13	10	0	0	0
	Mar.....	10	12	9	14	5	4	6	80	33.5	32.5	7 a. m.	31.7	32.8	31.9	74.7	69.6	68.1	67.5	3.4	13	12	10	0	0	0
	Apr.....	19	7	2	14	9	4	5	29	38.6	35.9	7 a. m.	47.4	49.4	48.5	64.4	46.1	63.4	57.8	3.4	12	12	10	0	0	0
	May.....	12	4	5	16	17	4	11	23	43.6	47.4	7 a. m.	48.3	49.4	48.5	63.5	44.1	63.4	59.0	3.4	13	12	10	0	0	0
	June.....	10	10	18	21	13	5	5	19	50.3	50.6	7 a. m.	50.6	51.7	50.0	72.3	51.3	63.4	63.9	3.4	13	10	0	0	0	0
	July.....	14	2	7	10	12	10	16	22	61.3	60.6	7 a. m.	61.7	63.0	61.1	73.5	60.8	71.5	64.6	3.4	10	10	0	0	0	0
	Aug.....	19	14	10	18	16	6	4	6	62.3	64.1	7 a. m.	63.0	64.5	64.0	73.9	64.5	71.5	64.6	3.4	13	10	0	0	0	0
	Sept.....	10	7	6	18	21	16	4	8	54.5	57.5	7 a. m.	59.7	59.7	64.0	72.3	47.5	70.4	63.5	2.3	19	11	0	0	0	0
	Oct.....	25	6	9	6	15	7	13	11	43.8	45.9	7 a. m.	45.8	45.8	44.5	75.0	43.9	67.4	63.5	4.1	16	7	0	0	0	0
	Nov.....	15	6	5	8	3	14	12	26	31.0	33.2	7 a. m.	33.5	35.0	33.1	67.6	50.4	67.8	61.9	3.8	15	6	0	0	0	0
	Dec.....	25	4	12	7	5	10	11	19	0	24.7	20.3	7 a. m.	20.3	23.6	68.9	65.8	71.0	63.6	4.3	10	8	0	0	0	0
Sums..	190	96	102	146	133	92	118	209	18	510.9	520.9	531.6	831.6	850.0	647.5	833.1	770.9	81.4	50.6	122	140	103	142	13	0	
Means.	17.3	8.7	9.3	13.2	11.8	10.3	13.0	19.0	1.6	43.6	43.4	44.3	69.4	70.8	54.0	69.4	64.7	5.1	4.2	33.6	33.3	28.1	33.8	3.8	0	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.02 a. m., 3.02 p. m., and 11.02 p. m., local time. Corrections for instrumental error of barometer used: From 7.02 a. m., January 1, to 11.02 p. m., September 4, inclusive, +.025 inch; from 7.02 a. m., September 5, to 11.02 p. m., December 31, inclusive, +.008 inch. Barometer 316 adopted as station instrument per instructions of August 9, 1884.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.050; February, 0.050; March, 0.050; April, 0.050; May, 0.050; June, 0.050; July, 0.050; August, 0.050; September, 0.050; October, 0.050; November, 0.050; December, 0.050.

REMARKS.—January, frequent rains and snows. February, unusually wet month; lunar halo 3d; thunder-storm 14th. March, much cloudy weather and rain; thunder-storm 9th; last frost of the season 17th. April, lunar corona 28th. May, thunder-storms 9th, 13th, 19th, 23d, and 24th. June, thunder-storms 3d, 22d, and 25th. July, excessive rainfall; heavy rain and thunder-storm 11th; thunder-storm 21st, 11th, 25th, and 31st; rainbow 27th. August, lunar halo 1st; earthquake shock 10th; thunder-storms 4th, 21st, and 29th; rainbow 29th. September, severe drought during month; total rainfall .09 inch, smallest rainfall on record for any month (1871-1884). October, lunar halo 4th; solar halo 26th. November, heavy frost 7th (first of season); lunar corona 4th and 30th. December, lunar corona 5th.

GEO. W. FELGER,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

BAEENEGAT CITY, N. J.

Location of office on December 31, 1884, corner Central Avenue and Sixth street.

[Latitude, 39° 40' N.; longitude, 74° 0' W. Elevation of barometer above sea-level, 22 feet. Elevation of exposed thermometer above ground, 17 feet. Elevation of rain-gauge above ground, 39 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).						Temperature.										Precipitation.			Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	Washington time.			Monthly mean.	Hi	Lowest.	Date.	Range.	Washington time.				Self-registering thermometer.				Total amount.	Any secondary 8-hourly measurements.	Date.	Direction.	Maximum hourly velocity during month.	Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	7 a. m.	3 p. m.	11 p. m.						Monthly mean.	Maximum.	Date.	Minimum.	Date.	Ab	Mean maximum.	Mean minimum.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						

## BARNEGAT CITY, N. J.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent).				Cloudiness (in tenths).				Number of days—														
	Number of calms.								7 a. m.		3 p. m.		11 p. m.		Mean.		7 a. m.		3 p. m.		11 p. m.		Mean.		Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunder-storms.	Aurora.
									North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.																	
1884.	22	12	7	4	3	18	14	13	0	21.0	24.8	21.9	22.6	79.4	79.3	77.5	77.7	6.2	15	11	15	10	27	0	0	0	0	0	0	0	0		
Jan.....	8	11	14	10	6	15	5	18	0	34.5	35.5	32.9	34.3	90.6	85.7	86.8	87.7	6.1	3	16	15	1	0	0	0	0	0	0	0	0	0		
Feb.....	14	18	6	8	14	8	19	0	31.0	34.6	32.8	32.6	82.4	76.1	79.1	78.2	6.1	3	13	14	3	0	0	0	0	0	0	0	0	0	0		
Mar.....	15	8	8	13	1	13	4	25	3	37.2	37.9	38.1	37.7	73.9	64.3	77.3	71.8	5.2	8	10	8	10	0	0	0	0	0	0	0	0	0		
Apr.....	6	9	6	3	12	29	6	18	3	50.3	49.7	49.8	49.9	77.2	69.3	79.9	74.5	4.8	6	19	6	0	0	0	0	0	0	0	0	0	0		
May.....	5	8	24	7	7	30	4	5	0	58.5	58.8	58.5	58.6	78.4	70.7	83.7	77.6	3.5	16	10	0	0	0	0	0	0	0	0	0	0	0		
June.....	12	5	10	9	9	22	9	17	0	61.6	61.2	62.9	61.9	78.9	67.5	82.1	76.2	3.0	5	19	0	0	0	0	0	0	0	0	0	0	0		
July.....	13	11	13	8	16	24	3	5	0	65.9	67.1	66.2	66.4	88.1	79.9	89.4	85.8	2.4	13	0	0	0	0	0	0	0	0	0	0	0	0		
Aug.....	11	3	8	5	12	30	16	9	0	62.5	65.0	63.3	63.6	84.1	77.8	87.2	82.9	4.0	9	12	0	0	0	0	0	0	0	0	0	0	0		
Sept.....	16	8	13	2	7	19	12	16	0	51.0	53.5	51.9	52.1	84.7	73.9	84.4	81.0	4.8	11	13	7	13	4	0	0	0	0	0	0	0	0		
Oct.....	12	12	3	7	6	13	15	21	1	39.0	41.9	40.9	40.6	85.4	72.7	84.6	80.9	3.2	17	7	6	7	11	0	0	0	0	0	0	0	0		
Nov.....	18	11	6	2	7	16	14	17	2	32.2	35.4	34.5	34.0	85.5	79.3	86.7	83.8	5.8	7	11	13	12	4	0	0	0	0	0	0	0	0		
Dec.....	16	11	6	2	7	16	14	17	2	32.2	35.4	34.5	34.0	85.5	79.3	86.7	83.8	5.8	7	11	13	12	4	0	0	0	0	0	0	0	0		
Sums ..	154	116	118	78	92	243	109	179	9	544.7	565.4	553.2	554.8	988.6	890.0	998.7	959.1	61.3	159	99	125	18	0	0	0	0	0	0	0	0	0		
Means ..	14	10	10	7	7	1	8	4	22	1	51.6	50.5	50.5	50.5	84.2	77.0	84.2	84.2	4.9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
	Percentages.																																

\* First 20 days only.

† Both minimum thermometers broken.

‡ For 25 days only.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.12 a. m., 3.12 p. m., and 11.12 p. m., local time.

Correction for instrumental error of barometer used: From 7.12 a. m., January 1, to 11.12 p. m., December 31, 1884, inclusive, —.011 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.020; February, 0.020; March, 0.020; April, 0.020; May, 0.020; June, 0.020; July, 0.020; August, 0.020; September, 0.020; October, 0.020; November, 0.020; December, 0.020.

GERALD E. GRIFFIN.

Private, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

BENNETT, FORT, DAK.

Location of office on December 31, 1884, room formerly adjutant's office.

[Latitude, 44° 48' N.; longitude, 100° 39' W. Elevation of barometer above sea-level, 1,510 (B) feet. Elevation of exposed thermometer above ground, 12 feet. Elevation of rain-gauge above ground, 18 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.			Total movement.			
Month.	Washington time.			Monthly mean.	Highest.	Data.	Lowest.	Data.	Range.	Washington time.			Self-registering thermometer.			Mean maximum.	Mean minimum.	Total amount.	Any secondary measurements.			Maximum hourly velocity during month.		Prevailing direction.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Data.				Minimum.	Absolute range.		Data.	Direction.	
1884.																								
Jan.	28.575	28.525	28.500	28.533	28.255	4	27.903	9	1.392	5.0	19.1	12.4	12	12.4	0	12	1	1.8	11	W.	W.	W.	W.	W.
Feb.	28.497	28.472	28.524	28.498	28.007	11	27.507	18	1.410	7.7	10.9	27.5	27	27.5	0	24	1	1.8	11	W.	W.	W.	W.	W.
Mar.	28.407	28.393	28.385	28.395	28.763	13	27.507	10	1.166	20.6	34.5	27.5	27	27.0	0	24	1	1.8	11	W.	W.	W.	W.	W.
Apr.	28.416	28.396	28.411	28.404	28.966	20	27.830	26	1.127	35.1	50.9	41.5	41	41.5	0	24	1	1.8	11	W.	W.	W.	W.	W.
May.	28.406	28.382	28.385	28.384	28.641	24	27.923	4	1.718	47.1	63.6	54.2	57	54.0	0	24	1	1.8	11	W.	W.	W.	W.	W.
June.	28.359	28.322	28.334	28.339	28.531	1	27.906	23	1.685	62.5	83.2	70.4	72	70.0	0	27	1	1.8	11	W.	W.	W.	W.	W.
July.	28.365	28.326	28.344	28.344	28.613	19	28.026	23	1.837	82.1	78.7	67.0	69	67.0	0	27	1	1.8	11	W.	W.	W.	W.	W.
Aug.	28.408	28.366	28.370	28.381	28.675	8	27.979	81	1.606	60.0	81.8	68.4	69	68.0	0	27	1	1.8	11	W.	W.	W.	W.	W.
Sept.	28.311	28.274	28.302	28.296	28.725	19	27.866	2	1.827	51.6	72.7	59.1	61	59.0	0	30	1	1.8	11	W.	W.	W.	W.	W.
Oct.	28.446	28.394	28.418	28.419	28.805	23	27.933	2	1.872	42.0	61.2	48.6	50	48.0	0	30	1	1.8	11	W.	W.	W.	W.	W.
Nov.	28.531	28.520	28.512	28.868	28.868	5	27.939	26	1.872	30.8	43.5	30.8	31	30.8	0	23	0	0	0	0	0	0	0	0
Dec.	28.528	28.518	28.560	28.532	28.688	24	27.935	5	1.038	4.9	14.6	8.6	9	8.0	0	23	0	0	0	0	0	0	0	0
Sum.	341.249	340.815	341.113	341.058	341.257	412.450	2405.750	5	11.257	412.4	620.2	485.7	500.5	412.5	0	318.6	0	123.7	123.7	123.7	123.7	123.7	123.7	123.7
Means	28.437	28.491	28.426	28.421	28.255	4	27.597	110	1.015	68.8	34.4	61.7	41.8	42.5	0	37	0	55.8	55.8	55.8	55.8	55.8	55.8	55.8

<sup>1</sup> Self-register defective; for 10 days only.

<sup>2</sup> Approximate.

<sup>3</sup> Self-register defective; for 9 days only.

<sup>4</sup> January.

<sup>5</sup> March.

<sup>6</sup> February.

<sup>7</sup> August.

<sup>8</sup> December.



## BENNETT, FORT, DAK.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—							Dew-point.			Relative humidity (per cent.).			Clearness (in tenths).			Number of days—								
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Washington time.			Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 50°.	Thunder-storms.	Aurora.
									7 a. m.	3 p. m.	11 p. m.														
1884.																									
Jan.	28	8	12	15	18	25	30	1.4	11.3	7.2	30.9	76.0	72.0	72.6	75.9	11	12	9	7	20	31	0	0	0	
Feb.	4	15	18	20	26	41	18	2.9	24.2	22.2	30.9	83.4	76.0	82.0	81.1	7	7	8	13	20	22	0	0	0	
Mar.	5	18	14	18	24	30	26	4.4	30.9	32.8	31.2	81.8	68.1	80.5	77.3	10	10	11	11	8	22	0	0	0	
Apr.	5	18	14	18	24	30	26	4.4	30.9	32.8	31.2	81.8	68.1	80.5	77.3	10	10	11	11	8	22	0	0	0	
May	9	15	14	18	24	30	26	4.4	30.9	32.8	31.2	81.8	68.1	80.5	77.3	10	10	11	11	8	22	0	0	0	
June	5	18	14	18	24	30	26	4.4	30.9	32.8	31.2	81.8	68.1	80.5	77.3	10	10	11	11	8	22	0	0	0	
July	4	26	11	18	24	30	26	4.4	30.9	32.8	31.2	81.8	68.1	80.5	77.3	10	10	11	11	8	22	0	0	0	
Aug.	1	13	11	18	24	30	26	4.4	30.9	32.8	31.2	81.8	68.1	80.5	77.3	10	10	11	11	8	22	0	0	0	
Sept.	1	13	11	18	24	30	26	4.4	30.9	32.8	31.2	81.8	68.1	80.5	77.3	10	10	11	11	8	22	0	0	0	
Oct.	9	2	1	1	1	1	1	2.0	17.8	27.0	24.0	88.5	87.7	85.8	82.0	13	13	13	4	0	7	0	0	0	
Nov.	4	11	1	1	1	1	1	2.0	17.8	27.0	24.0	88.5	87.7	85.8	82.0	13	13	13	4	0	7	0	0	0	
Dec.	7	8	0	1	1	1	1	2.0	17.8	27.0	24.0	88.5	87.7	85.8	82.0	13	13	13	4	0	7	0	0	0	
Sums..	59	146	16	224	13	48	24	328	384	389	378.5	968.7	851.2	871.6	837.3	135	156	75	93	74	171	24	33	2	
Means..	Percentages.																								
	5.4	13.2	1.6	23.5	1.2	4.1	2.5	32.9	32.4	31.5	31.5	82.4	64.2	72.6	83.8	4.7	5.4	4.5	25.4	20.2	46.7	6.6	9.0	0.5	

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5:26 a. m., 1:26 p. m., and 9:26 p. m., local time.

Correction for instrumental error of barometer used: From 5:26 a. m., January 1, 1884, to 9:26 p. m., December 31, 1884, inclusive, +.022.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.740; February, 1.739; March, 1.700; April, 1.640; May, 1.590; June, 1.540; July, 1.540; August, 1.540; September, 1.590; October, 1.620; November, 1.690; December, 1.760.

REMARKS.—April, navigation opened on 6th; May, frequent rains, thunder-storms; June, heavy rains, thunder-storms; July, continued heavy rains, hail-storm 1st; August, very dry, high temperature; September, continued dry weather; October, first snow 20th, frequent frosts; December, remarkably low temperature, snow.

A. PRITCHARD,

Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

BENTON, FORT, MONT.

Location of office on December 31, 1884, Grand Union Hotel.

[Latitude, 47° 50' N.; longitude, 110° 40' W. Elevation of barometer above sea-level, 3,631 (B) feet. Elevation of exposed thermometer above ground, 33 feet. Elevation of rain-gauge above ground, 49 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.								Precipitation.				Wind.				Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	Washington time.					Washington time.					Self-registering thermometer.				Total amount.				Any 3 consecutive 8-hourly measurements.				Maximum hourly velocity during month.					Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	7 p. m.		8 p. m.		11 p. m.		Monthly mean.		11 p. m.		Monthly mean.		Maximum.		Date.		Minimum.		Date.		Absolute range.		Mean maximum.		Mean minimum.			Total amount.		Date.		Direction from—		Date.		Miles.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	in.	W.	in.	W.	in.	W.	in.	W.	in.	W.	in.	W.	in.	W.	in.	W.	in.	W.	in.	W.	in.	W.	in.	W.	in.	W.		in.	W.	in.	W.	in.	W.	in.	W.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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Eight days.

Twenty-four days.

One 7 a. m., two 3 p. m., one 11 p. m. observations missed.

Twenty-seven days.

Two 7 a. m., two 3 p. m., two 11 p. m. observations missed.

Four 7 a. m., four 3 p. m., four 11 p. m. observations missed.

Three 7 a. m., three 3 p. m., three 11 p. m. observations missed.

Thirteen days.

February.

June.

December.

## KEWTON, FORT, MONT.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.	Relative humidity (per cent.).	Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.			Washington time.				Clear.	Fair.	Cloudy.	On which all back or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 50°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
											7 a. m.	3 p. m.	11 p. m.	Mean.										7 a. m.	3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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Jan.	2	7	0	0	0	0	0	45	0.7	12.0	5.4	4.0	62.0	56.7	52.2	56.0	5	13	6	14	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Eight days.

One 7 a. m., two 3 p. m., one 11 p. m. observations missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.46 a. m., 12.46 p. m., and 8.46 p. m., local time.

Correction for instrumental error of barometer used: +.026 for entire year.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.97; February, 2.90; March, 2.97; April,

2.85; May, 2.78; June, 2.76; July, 2.70; August, 2.78; September, 2.83; October, 2.90; November, 2.95; December, 2.98.

REMARKS.—February 24, the ice in the river broke; on 25th an immense gorge formed, flooding entire town. July 15, a hail-storm. September 7, first frost of season.

October 2, first snow of season. December noted for its remarkable cold and calm.

B. O. LIESDIE,

Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

BISMARCK, DAK.

Location of office on December 31, 1884, corner Main and Third streets.

[Latitude, 49° 47' N.; longitude, 100° 39' W. Elevation of barometer above sea-level, 1,664 feet. Elevation of exposed thermometer above ground, 18 feet. Elevation of rain-gauge above ground, 31 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).						Temperature.						Precipitation.			Wind.		
	Washington time.			Monthly mean.			Washington time.			Self-registering thermometers.			Any consecutive hourly measurements.			Maximum hourly velocity during month.		
	7 p. m.	3 p. m.	11 p. m.	7 p. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Date.	Range.	Abundance.	Lowest.	Amount.	Date.	Direction.	Date.	Prevailing direction.
1884.																		
Jan	In. 28.206	28.307	28.262	28.276	In. 28.276	28.276	28.276	28.276	28.276	28.276	28.276	28.276	28.276	28.276	28.276	28.276	28.276	28.276
Feb	In. 28.226	28.231	28.203	28.239	In. 28.239	28.239	28.239	28.239	28.239	28.239	28.239	28.239	28.239	28.239	28.239	28.239	28.239	28.239
Mar	In. 28.156	28.145	28.151	28.151	In. 28.151	28.151	28.151	28.151	28.151	28.151	28.151	28.151	28.151	28.151	28.151	28.151	28.151	28.151
Apr	In. 28.190	28.178	28.179	28.182	In. 28.182	28.182	28.182	28.182	28.182	28.182	28.182	28.182	28.182	28.182	28.182	28.182	28.182	28.182
May	In. 28.183	28.155	28.156	28.168	In. 28.168	28.168	28.168	28.168	28.168	28.168	28.168	28.168	28.168	28.168	28.168	28.168	28.168	28.168
June	In. 28.136	28.114	28.109	28.128	In. 28.128	28.128	28.128	28.128	28.128	28.128	28.128	28.128	28.128	28.128	28.128	28.128	28.128	28.128
July	In. 28.149	28.123	28.125	28.125	In. 28.125	28.125	28.125	28.125	28.125	28.125	28.125	28.125	28.125	28.125	28.125	28.125	28.125	28.125
Aug	In. 28.164	28.145	28.147	28.153	In. 28.153	28.153	28.153	28.153	28.153	28.153	28.153	28.153	28.153	28.153	28.153	28.153	28.153	28.153
Sept	In. 28.074	28.055	28.068	28.072	In. 28.072	28.072	28.072	28.072	28.072	28.072	28.072	28.072	28.072	28.072	28.072	28.072	28.072	28.072
Oct	In. 28.123	28.143	28.170	28.166	In. 28.166	28.166	28.166	28.166	28.166	28.166	28.166	28.166	28.166	28.166	28.166	28.166	28.166	28.166
Nov	In. 28.255	28.263	28.263	28.258	In. 28.258	28.258	28.258	28.258	28.258	28.258	28.258	28.258	28.258	28.258	28.258	28.258	28.258	28.258
Dec	In. 28.233	28.206	28.204	28.208	In. 28.208	28.208	28.208	28.208	28.208	28.208	28.208	28.208	28.208	28.208	28.208	28.208	28.208	28.208
Summ.	In. 28.207	28.203	28.223	28.203	In. 28.203	28.203	28.203	28.203	28.203	28.203	28.203	28.203	28.203	28.203	28.203	28.203	28.203	28.203
Means	In. 28.196	28.173	28.185	28.183	In. 28.183	28.183	28.183	28.183	28.183	28.183	28.183	28.183	28.183	28.183	28.183	28.183	28.183	28.183

° January.

1 February.

3 June.

### **808MARBOK, DAK.—Continued.**

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—							Dew-point				Relative humidity (per cent.).			Cloudiness (in tenths).			Number of days—											
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.			Mean.			Mean.			Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 33°.	Minimum below 33°.	Maximum above 30°.	Thunder-storms.	Autumn.				
								7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.										11 p. m.	Mean.		
1864.																													
Jan.	11	7	10	4	4	10	24	10	2.8	0.0	0.5	30.1	1022.7	770.1	900.2	920.1	54.0	56.6	43.2	51.3	137	159	70	126	97	176	4	18	7
Feb.	20	9	12	3	1	10	28	17	3.9	0.6	3.5	30.1	1022.7	770.1	900.2	920.1	54.0	56.6	43.2	51.3	137	159	70	126	97	176	4	18	7
Mar.	25	12	13	8	1	10	21	12	8.8	18.5	14.1	30.1	1022.7	770.1	900.2	920.1	54.0	56.6	43.2	51.3	137	159	70	126	97	176	4	18	7
Apr.	19	12	4	10	2	10	28	11	16.4	43.1	42.6	30.1	1022.7	770.1	900.2	920.1	54.0	56.6	43.2	51.3	137	159	70	126	97	176	4	18	7
May	11	8	12	15	24	2	8	6	12.5	59.9	60.0	30.1	1022.7	770.1	900.2	920.1	54.0	56.6	43.2	51.3	137	159	70	126	97	176	4	18	7
June	11	8	12	15	24	2	8	6	12.5	59.9	60.0	30.1	1022.7	770.1	900.2	920.1	54.0	56.6	43.2	51.3	137	159	70	126	97	176	4	18	7
July	11	8	12	15	24	2	8	6	12.5	59.9	60.0	30.1	1022.7	770.1	900.2	920.1	54.0	56.6	43.2	51.3	137	159	70	126	97	176	4	18	7
Aug.	10	8	9	8	21	0	2	14	52.8	57.4	55.9	30.1	1022.7	770.1	900.2	920.1	54.0	56.6	43.2	51.3	137	159	70	126	97	176	4	18	7
Sept.	8	14	4	6	4	11	21	17	45.0	50.5	47.9	30.1	1022.7	770.1	900.2	920.1	54.0	56.6	43.2	51.3	137	159	70	126	97	176	4	18	7
Oct.	11	9	4	6	4	11	21	17	45.0	50.5	47.9	30.1	1022.7	770.1	900.2	920.1	54.0	56.6	43.2	51.3	137	159	70	126	97	176	4	18	7
Nov.	16	4	5	8	2	7	31	24	18.6	27.4	22.6	30.1	1022.7	770.1	900.2	920.1	54.0	56.6	43.2	51.3	137	159	70	126	97	176	4	18	7
Dec.	10	2	4	5	8	2	31	25	2.8	0.4	1.0	30.1	1022.7	770.1	900.2	920.1	54.0	56.6	43.2	51.3	137	159	70	126	97	176	4	18	7
Sums	165	83	112	119	104	28	51	241	1063.5	285.2	285.0	30.1	1022.7	770.1	900.2	920.1	54.0	56.6	43.2	51.3	137	159	70	126	97	176	4	18	7
Means	15.0	7.5	10.2	10.8	9.5	2.6	4.0	21.9	27.6	22.1	30.5	30.1	85.8	64.2	80.6	76.7	4.5	4.7	2.6	4.3	37.4	45.4	18.1	34.4	26.5	48.1	1.1	1.4	91.9
	Percentages.							Percentages.																					

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.26 a. m., 1.26 p. m., and 9.26 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.003 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.00; February, 1.98; March, 1.93; April, 1.90; May, 1.87; June, 1.84; July, 1.81; August, 1.78; September, 1.75; October, 1.72; November, 1.69; December, 1.66.

May, 1.79; June, 1.76; July, 1.73; Aug.  
REMARKS.—Meteoric shower May 28.

C. S. BENNETT,  
Private, Signal Corps, U. S. A.

**Meteorological summary for the year ending December 31, 1884—Continued.**

**BLOCK ISLAND, R. I.**

**Location of office on December 31, 1884, corner of Main and Beach streets.**

[Latitude, 41° 10' N.; longitude, 71° 39' W. Elevation of barometer above sea-level, 27 feet. Elevation of exposed thermometer above ground, 8 feet. Elevation of rain-gauge above ground, 23 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).						Temperature.						Precipitation.		Wind.							
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Range.	Washington time.			Self-registering thermometer.			Total amount.	Any 2 consecutive 8-hourly measurements.	Maximum hourly velocity during month.		Prevailing direction.	Total movement.		
	7 P. M.	11 P. M.	Range.						7 P. M.	11 P. M.	Monthly mean.	Maximum.	Date.	Minimum.			Date.	Absolute range.			Mean maximum.	Mean minimum.
1864.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.		
Jan.....	30.104	30.066	30.071	30.077	30.738	27	38.5	54.0	2	8.0	9	43.0	37.1	28.2	2.431.65	8.9	49	SW.	2	N. 14, 115		
Feb.....	30.087	30.066	30.066	30.040	30.776	16	33.0	54.0	14	10.5	29	43.5	23.0	7.311.10	23	44	NW.	23	11, 175			
Mar.....	30.087	30.043	30.069	30.033	30.407	11	33.0	55.3	25	10.0	1	45.3	22.0	6.401.77	19	48	NW.	30	11, 733			
Apr.....	30.107	30.100	30.100	30.076	30.167	14	33.0	54.0	20	10.0	1	45.3	22.0	6.401.77	19	48	NW.	30	9, 911			
May.....	30.093	30.087	30.091	30.091	30.809	15	33.0	54.0	20	10.0	1	45.3	22.0	6.401.77	19	48	NW.	30	10, 667			
June.....	30.074	30.059	30.061	30.059	30.779	9	33.0	54.0	20	10.0	1	45.3	22.0	6.401.77	19	48	NW.	30	8, 816			
July.....	30.083	30.085	30.084	30.085	30.759	4	33.0	54.0	20	10.0	1	45.3	22.0	6.401.77	19	48	NW.	30	10, 450			
Aug.....	30.040	30.013	30.031	30.028	30.307	26	33.0	54.0	20	10.0	1	45.3	22.0	6.401.77	19	48	NW.	30	9, 434			
Sept.....	30.068	30.047	30.073	30.068	30.438	14	33.0	54.0	20	10.0	1	45.3	22.0	6.401.77	19	48	NW.	30	7, 453			
Oct.....	30.109	30.093	30.097	30.093	30.564	26	33.0	54.0	20	10.0	1	45.3	22.0	6.401.77	19	48	NW.	30	8, 068			
Nov.....	30.088	30.010	30.019	30.019	30.473	20	33.0	54.0	20	10.0	1	45.3	22.0	6.401.77	19	48	NW.	30	11, 494			
Dec.....	30.133	30.090	30.094	30.105	30.650	27	37.0	60.0	7	3.3	20	65.3	44.0	5.561.87	23	44	NW.	19	10, 450			
Sum.....	30.153	30.070	30.076	30.080	30.738	27	38.5	54.0	2	8.0	9	43.0	37.1	28.2	2.431.65	8.9	49	SW.	26	13, 003		
Means.....	30.014	30.075	30.085	30.086	30.738	27	38.5	54.0	2	8.0	9	43.0	37.1	28.2	2.431.65	8.9	49	SW.	26	13, 003		

**5 December.**

**September.**

**February.**

**January.**

## HLOOK ISLAND, R. L.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.			Relative humidity (per cent.).			Clearness (in tenths).			Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calm.			Washington time.			Clear.	Part.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 50°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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															7 a. m.	3 p. m.	11 p. m.								Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.22 a. m., 3.22 p. m., and 11.22 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.015 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, .030; February, .030; March, .030; April, .030; May, .030; June, .030; July, .030; August, .030; September, .030; October, .030; November, .030; December, .030.

REMARKS.—January 7 and 10, lunar halo; January 23, solar halo; February 3, light frost, solar halo, polar bands; February 10, lunar corona; February 22, heavy frost; February 23, heavy rain and thunder-storm; March 1, aurora; March 13, polar bands; March 22, light frost; March 23, lightning; April 2, 16, 17, thunder-storms; April 26, meteor; April 28, light frost; May 5, 9, 20, thunder-storms; June 14, solar halo; June 19, 26, thunder-storms; July 6, 12, 13, 19, thunder-storms; August 15, mirage; August 22, thunder-storm; September 13, aurora; November 2, aurora, meteor; November 10, 16, 22, light frost; December 23, lunar halo; December 25, lunar corona.

JNO. T. EIKER,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*  
BOISE CITY, IDAHO.

Location of office on December 31, 1884, Davis building.

[Latitude, 43° 27' N.; longitude, 116° 9' W. Elevation of barometer above sea-level, 2,750 feet. Elevation of exposed thermometer above ground, 20 feet. Elevation of rain-gauge above ground, 32 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.			Wind.							
	Washington time.					Monthly mean.					Washington time.					Self-registering thermometers.					Any 3 consecutive 8-hourly measurements.			Maximum hourly velocity during month.			Prevailing direction.		Total movement		
	7 P.	9 P.	11 P.	11 P.	11 P.	In.	In.	In.	In.	In.	7 P.	9 P.	11 P.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Abolite range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction.	From—	Date.	Miles.		
1884.																															
Jan.	27.303	27.308	27.300	27.373	27.595	27.576	27.576	27.576	27.576	27.576	27.576	27.576	27.576	27.576	27.576	27.576	27.576	27.576	27.576	27.576	27.576	27.576	27.576	27.576	27.576	27.576	27.576	27.576	27.576	27.576	
Feb.	27.185	27.196	27.179	27.193	27.193	27.193	27.193	27.193	27.193	27.193	27.193	27.193	27.193	27.193	27.193	27.193	27.193	27.193	27.193	27.193	27.193	27.193	27.193	27.193	27.193	27.193	27.193	27.193	27.193	27.193	27.193
Mar.	27.069	27.069	27.047	27.063	27.426	27.426	27.426	27.426	27.426	27.426	27.426	27.426	27.426	27.426	27.426	27.426	27.426	27.426	27.426	27.426	27.426	27.426	27.426	27.426	27.426	27.426	27.426	27.426	27.426	27.426	27.426
Apr.	27.076	27.087	27.058	27.073	27.375	27.375	27.375	27.375	27.375	27.375	27.375	27.375	27.375	27.375	27.375	27.375	27.375	27.375	27.375	27.375	27.375	27.375	27.375	27.375	27.375	27.375	27.375	27.375	27.375	27.375	27.375
May.	27.140	27.140	27.100	27.127	27.423	27.423	27.423	27.423	27.423	27.423	27.423	27.423	27.423	27.423	27.423	27.423	27.423	27.423	27.423	27.423	27.423	27.423	27.423	27.423	27.423	27.423	27.423	27.423	27.423	27.423	27.423
June.	27.120	27.110	27.080	27.108	27.374	27.374	27.374	27.374	27.374	27.374	27.374	27.374	27.374	27.374	27.374	27.374	27.374	27.374	27.374	27.374	27.374	27.374	27.374	27.374	27.374	27.374	27.374	27.374	27.374	27.374	27.374
July.	27.147	27.155	27.108	27.137	27.480	27.480	27.480	27.480	27.480	27.480	27.480	27.480	27.480	27.480	27.480	27.480	27.480	27.480	27.480	27.480	27.480	27.480	27.480	27.480	27.480	27.480	27.480	27.480	27.480	27.480	27.480
Aug.	27.174	27.161	27.111	27.149	27.409	27.409	27.409	27.409	27.409	27.409	27.409	27.409	27.409	27.409	27.409	27.409	27.409	27.409	27.409	27.409	27.409	27.409	27.409	27.409	27.409	27.409	27.409	27.409	27.409	27.409	27.409
Sept.	27.172	27.155	27.110	27.146	27.406	27.406	27.406	27.406	27.406	27.406	27.406	27.406	27.406	27.406	27.406	27.406	27.406	27.406	27.406	27.406	27.406	27.406	27.406	27.406	27.406	27.406	27.406	27.406	27.406	27.406	27.406
Oct.	27.238	27.232	27.208	27.226	27.558	27.558	27.558	27.558	27.558	27.558	27.558	27.558	27.558	27.558	27.558	27.558	27.558	27.558	27.558	27.558	27.558	27.558	27.558	27.558	27.558	27.558	27.558	27.558	27.558	27.558	27.558
Nov.	27.302	27.283	27.237	27.261	27.618	27.618	27.618	27.618	27.618	27.618	27.618	27.618	27.618	27.618	27.618	27.618	27.618	27.618	27.618	27.618	27.618	27.618	27.618	27.618	27.618	27.618	27.618	27.618	27.618	27.618	27.618
Dec.	27.112	27.107	27.060	27.106	27.671	27.671	27.671	27.671	27.671	27.671	27.671	27.671	27.671	27.671	27.671	27.671	27.671	27.671	27.671	27.671	27.671	27.671	27.671	27.671	27.671	27.671	27.671	27.671	27.671	27.671	27.671
Sums.	225.188	225.127	225.797	225.089	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886
Means.	27.182	27.177	27.150	27.170	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886	27.886

January. February. June. August.



## BOISE CITY, IDAHO—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.	Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	North. Northeast. East. Southeast. South. Southwest. West. Northwest.														On which, .01 inch or more precipitation fell. Maximum below 32°. Minimum below 32°. Maximum above 80°. Thunder-storms.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
								7 a. m.		3 p. m.		11 p. m.		Mean.		7 a. m.		3 p. m.		11 p. m.		Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
1884.	8	0	4	14	6	15	23	18	0	14.4	27.8	28.4	22.9	88.7	75.1	70.5	81.1	2.2	5.3	4.4	4	2	30	19	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.24 a. m., 12.24 p. m., and 8.24 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, inclusive, +.014 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.930; February, 2.980; March, 2.920; April, 2.840; May, 2.840; June, 2.780; July, 2.720; August, 2.750; September, 2.770; October, 2.860; November, 2.940; December, 2.980.

REMARKS.—February, one foggy day; March 26, last snow-fall; May 4, last frost; May 11, flood of Boise River carried away section of bridge; June, thunder-storms and lightning very frequent and precipitation excessive; July 28, zodiacal light in evening; September 3, first frost (light); September 25, first killing frost and ice; October 13, unusually severe electrical disturbance, with sleet and heavy rain; December 15–17, very heavy snow-storm; monthly precipitation excessive.

JAMES KENEALY,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

BOSTON, MASS.

Location of office on December 31, 1884, post-office and sub-treasury building.

[Latitude, 42° 21' N.; longitude, 71° 4' W. Elevation of barometer above sea-level, 123 feet. Elevation of exposed thermometer above ground, 116 feet. Elevation of rain-gauge above ground, 174 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.								Precipitation.				Wind.					
	Washington time.			Monthly mean.			Washington time.			Self-registering thermometers.				Any 2 consecutive 5-hourly measurements.				Maximum hourly velocity during month.		Prevailing direction.		Total movement.						
	7 p. m.	9 p. m.	11 p. m.	In.	Lowest.	Highest.	Range.	7 a. m.	9 a. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Abolute range.	Mean maximum.	Mean minimum.	Total amount.	Far east amount.	Date.		Miles.	Direction from—	Date.			
1884.																												
Jan.	23.977	23.935	23.949	23.955	23.974	27.28.973	2.1.702	20.2	27.2	23.0	23.8	52.2	9	0.5	52.7	32.0	16.2	0	6.372	3.14	9	48	SE	9	48	N.W.	8,674	
Feb.	23.949	23.885	23.945	23.920	23.943	26.28.889	2.1.804	30.2	27.8	33.0	30.0	59.0	14	3.0	59.0	32.1	16.2	0	5.741	1.36	20	44	SE	20	44	N.W.	7,500	
Mar.	23.899	23.856	23.849	23.867	23.908	27.1.23.308	1.000	20.4	28.2	23.4	23.0	60.5	24	4.5	60.5	36.7	36.7	0	4.761	1.73	19	36	N.W.	19	36	N.W.	8,764	
Apr.	23.674	23.648	23.679	23.667	23.706	30.0.40.3	1.244	40.3	46.2	41.7	42.7	69.0	16	27.0	69.0	50.8	50.8	0	4.761	1.45	3	29	N.E.	3	29	N.W.	7,995	
May	23.814	23.768	23.810	23.797	23.828	30.1.79.31	0.851	63.2	58.3	51.0	53.8	87.5	24	35.0	87.5	64.2	45.6	0	8.31	0.87	20	36	N.E.	20	36	N.W.	7,795	
June	23.978	23.931	23.940	23.950	23.944	30.1.44.15	0.853	63.2	71.7	63.2	63.2	92.6	21	42.0	92.6	77.9	60.1	0	4.012	0.56	25	26	N.E.	25	26	S.W.	8,389	
July	23.707	23.666	23.681	23.688	23.739	30.2.39.4	1.544	65.8	73.6	65.8	63.0	94.8	18	51.0	94.8	77.6	60.1	0	4.25	1.83	20	24	N.W.	20	24	S.W.	8,808	
Aug.	23.935	23.895	23.919	23.916	23.910	30.2.10.25	0.829	65.8	72.9	65.8	63.2	94.8	10	49.5	94.8	76.6	57.2	0	5.011	0.80	11	25	N.	11	25	S.W.	5,723	
Sept.	23.969	23.910	23.944	23.941	23.976	30.3.30.14	1.755	61.8	72.9	63.2	63.2	94.8	1	30.5	94.8	61.5	50.0	0	3.171	1.38	20	31	N.W.	20	31	S.W.	6,101	
Oct.	23.968	23.921	23.962	23.957	23.948	30.3.48.23	1.987	49.3	57.5	50.2	50.2	83.8	1	30.5	83.8	53.7	50.0	0	2.171	1.37	23	47	S.	23	47	S.W.	9,388	
Nov.	23.904	23.874	23.889	23.889	23.910	30.3.48.23	1.153	87.2	46.0	40.2	40.2	65.1	21	31.5	65.1	43.6	32.6	0	2.081	1.51	23	47	S.	23	47	S.W.	8,723	
Dec.	23.005	23.904	23.901	23.977	23.903	27.23.332	1.271	23.8	34.1	33.5	33.1	62.1	31	3.5	62.1	41.2	34.2	0	4.461	1.55	31	44	S.W.	31	44	S.W.	8,730	
Sum.	23.789	23.745	23.753	23.754	23.765	27.23.332	1.271	54.9	64.9	50.7	4	62.1	31	3.5	62.1	41.2	34.2	18	3.14	1.55	17	23	S.	17	23	S.W.	32,358	
Means	23.877	23.850	23.878	23.875	23.874	27.23.332	1.003	45.2	52.9	46.7	48.7	64.2	31	3.5	64.2	51.0	40.5	48.5	18	1.55	1.55	31	44	S.W.	31	44	S.W.	8,730
										† January.				† April.				† September.				† December.						
										* For 30 days.																		

December.

September.

April.

January.

For 30 days.

## BOSTON, MASS.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—												
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 50°.	Thunder-storms.	Aurora.					
1884.																															
Jan.....	6	17	9	4	5	14	9	22	31	23	12.9	18.3	0	73.5	70.2	70.1	73.3	6.0	6.2	6.1	8	11	12	18	14	30	0	0	0	0	
Feb.....	6	17	9	4	4	10	20	32	0	23.5	25.5	28.4	26.1	27.0	86.7	83.9	85.4	85.3	8.4	8.2	6.5	1	10	18	18	3	24	0	0	0	0
Mar.....	11	18	14	4	4	10	20	32	0	23.9	28.6	28.0	28.0	28.0	80.0	76.5	77.4	77.4	7.5	7.2	4.8	0	11	14	18	5	19	0	0	0	0
Apr.....	8	9	6	14	2	8	2	10	83	0	38.2	38.2	37.3	37.3	36.9	76.5	85.2	82.9	6.5	6.9	6.2	7	6	17	17	0	0	0	0	0	0
May.....	8	9	6	14	7	15	21	18	0	45.3	45.7	45.0	45.7	45.7	78.9	69.7	81.6	76.7	5.1	6.1	3.7	8	17	6	17	0	0	0	0	0	0
June.....	4	12	10	6	4	23	23	7	1	56.0	57.7	56.8	56.8	56.8	80.7	64.4	80.6	74.5	2.9	3.7	1.9	18	9	3	7	0	0	0	0	0	0
July.....	6	5	7	9	5	22	22	18	0	58.9	59.7	60.2	59.8	59.8	80.7	63.6	84.8	76.4	5.4	5.7	5.4	7	13	11	17	0	0	0	0	0	0
Aug.....	8	6	2	15	10	26	14	11	1	61.5	63.9	63.1	62.8	62.8	86.9	75.0	91.6	84.5	3.0	3.2	4.9	7	15	9	14	0	0	0	0	0	0
Sept.....	4	8	8	9	4	31	17	16	3	53.6	56.1	56.6	55.4	55.4	76.4	57.5	79.6	71.2	4.5	3.3	3.5	4	15	13	8	0	0	0	0	0	0
Oct.....	11	2	3	1	8	23	28	14	0	40.4	40.5	41.6	40.8	40.8	72.2	56.2	73.5	67.3	4.5	3.5	5.0	10	11	10	18	0	0	0	0	0	0
Nov.....	11	2	3	1	8	23	28	14	0	31.1	31.0	32.3	31.5	31.5	78.9	58.2	74.9	70.8	6.0	4.9	4.7	6	10	13	8	0	0	0	0	0	0
Dec.....	12	1	2	2	8	23	23	22	0	22.9	24.0	25.6	24.2	24.2	75.6	62.7	73.2	70.8	6.0	6.3	5.8	6	12	13	13	17	0	0	0	0	0
Sums ..	88	87	68	71	64	286	232	246	6	468.2	494.1	489.8	483.9	483.9	808.6	693.1	911.0	693.1	67.0	69.2	57.7	108	140	123	153	20	100	10	17	10	10
Means ..	8.0	7.9	6.2	6.5	5.8	21.5	21.1	22.4	0.5	39.0	41.2	40.8	40.3	40.3	79.6	67.4	80.8	75.9	5.6	5.8	4.8	38.1	52.3	33.6	43.2	7.9	23.8	2.7	4.6	2.7	4.6
	Percentages.																					Percentages.									

\* 30 days only.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.24 a. m., 3.24 p. m., and 11.24 p. m., local time. Correction for instrumental error of barometer used: From January 1 to December 31, 1884, inclusive, +.010 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.140; February, 0.140; March, 0.140; April, 0.140; May, 0.140; June, 0.130; July, 0.130; August, 0.130; September, 0.130; October, 0.130; November, 0.130; December, 0.130.

REMARKS.—The elevation of instruments was changed as follows on October 1, 1884: Old elevation: Barometer, 142.19 feet; exposed thermometer, 155.41 feet; wet bulb thermometer, 153.58 feet; maximum thermometer, 153.82 feet; minimum thermometer, 166.02 feet; rain-gauge, 161.59 feet; anemometer, 177.67. New elevation: Barometer, 124.83 feet; exposed thermometer, 116.29 feet; wet bulb thermometer, 116.38 feet; maximum thermometer, 116.62 feet; minimum thermometer, 117.76 feet; rain-gauge, 172.97 feet; anemometer, 181.00 feet; anemoscope, 183.83 feet.

OTTO B. COLE,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1894—Continued.*

BROWNSVILLE, TEX.

Location of office on December 31, 1894, corner Elizabeth and Fourteenth streets.

[Latitude, 29° 53' N.; longitude, 97° 20' W. Elevation of barometer above sea-level, 57 feet. Elevation of exposed thermometer above ground, 17 feet. Elevation of rain-gauge above ground, 34 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.										
Month.	Washington time.				Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.				Total amount.	Any 8 consecutive 8-hourly measurements.	Maximum hourly velocity during month.		Prevailing direction.	Total movement.					
	7 p. m.	2 p. m.	11 p. m.	In.						7 p. m.	2 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.			Absolute range.	Mean maximum.			Mean minimum.	Largest amount.	Date.	Miles.	Direction from—
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	7 p. m.	2 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Any 8 consecutive 8-hourly measurements.	Date.	Miles.	Direction from—	Date.	N.	Miles.
Jan.....	30.183	30.159	30.203	30.182	30.645	29.689	29.705	29.642	29.730	30.183	30.000	14	34.8	6	55.2	63.8	44.2	1.10	7.75	15.16	41	S	10	N.	9,963			
Feb.....	30.078	30.076	30.015	29.987	30.369	29.864	29.809	29.772	29.818	30.000	30.000	13	33.0	15	51.6	75.6	53.7	—	—	29	36	S.E.	4	S.E.	8,404			
Mar.....	29.906	29.878	29.917	29.900	30.235	29.626	29.609	29.642	29.772	29.874	29.874	7	35.6	1	54.7	79.7	62.0	—	—	13	34	S	5	S	8,166			
Apr.....	29.850	29.830	29.868	29.849	30.156	29.613	29.643	29.613	29.788	29.894	29.894	19	47.0	22	48.2	82.8	64.1	—	—	13	34	S.E.	28	S.E.	8,201			
May.....	29.860	29.845	29.881	29.862	30.128	29.689	29.643	29.713	29.844	29.944	29.944	22	57.8	8	84.2	87.0	69.8	5.96	2.69	23	24	S.E.	27	S.E.	4,388			
June.....	29.876	29.869	29.881	29.875	30.068	29.778	29.744	29.808	29.888	29.944	29.944	14	67.3	5	27.0	89.9	73.0	2.74	1.75	23	24	N.E.	37	S	7,367			
July.....	29.900	29.894	29.903	29.896	30.068	29.768	29.778	29.844	29.905	29.944	29.944	16	74.0	21	21.8	92.3	77.2	23	13	23	24	N.	37	S	4,623			
Aug.....	29.922	29.902	29.928	29.917	30.031	29.825	29.825	29.872	29.944	29.944	29.944	12	68.0	9	27.0	92.3	74.4	—	—	27	28	S.E.	19	S.E.	4,623			
Sept.....	29.878	29.854	29.886	29.876	30.065	29.729	29.729	29.808	29.872	29.872	29.872	8	60.8	1	26.7	89.6	74.5	8.93	0.08	19	20	S.E.	37	S	8,994			
Oct.....	29.948	29.953	29.991	29.971	30.148	29.825	29.825	29.894	29.944	29.944	29.944	22	57.0	23	31.0	88.8	68.3	15.71	4.86	27	28	N.W.	24	N	8,994			
Nov.....	30.055	30.025	30.080	30.053	30.372	29.859	29.859	29.922	30.000	30.000	30.000	11	50.0	23	48.0	74.9	53.8	2.40	1.23	27	28	S	29	N	4,533			
Dec.....	29.943	29.915	29.974	29.951	30.325	29.823	29.823	29.894	29.944	29.944	29.944	11	50.0	23	48.0	74.9	53.8	1.38	0.90	27	28	S	29	N	4,081			
Sums	359.319	359.101	358.534	358.318	30.645	29.813	29.813	29.813	29.813	29.813	29.813	22	24.8	22	24.8	468.5	390.8	775.4	91	—	—	—	—	S.E.	74,175			
Means	29.943	29.925	29.961	29.943	30.645	29.813	29.813	29.813	29.813	29.813	29.813	22	24.8	22	24.8	468.5	390.8	775.4	91	—	—	—	—	S.E.	74,175			

† September.

† April.

\* January.

## BROWNSVILLE, TEX.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m. Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—											
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.			Washington time.						Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunder-storms.	Aurora.
									North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.										
1884.																										
Jan.	36	6	13	8	18	0	4	2	41.4	42.2	45.9	43.5	80.8	87.7	88.6	86.4	72.4	11	18	5	0	0	0	0	0	
Feb.	12	9	7	41	13	2	2	2	56.4	55.7	57.2	56.4	89.4	86.2	88.6	88.0	77.1	11	12	6	0	0	0	0	0	
Mar.	14	18	6	12	32	2	3	3	62.1	60.4	63.8	62.1	93.2	93.2	93.9	90.4	80.4	7	11	13	0	0	0	0	0	
Apr.	11	10	13	25	19	2	0	7	63.6	67.8	70.9	68.4	91.7	94.5	94.5	84.2	76.8	9	9	11	0	0	0	0	0	
May	6	15	18	28	15	1	0	3	68.5	70.9	73.2	72.8	94.6	96.1	96.1	84.8	80.2	10	11	11	0	0	0	0	0	
June	2	11	23	29	9	1	0	1	72.8	72.2	75.7	74.4	93.0	95.4	95.4	84.8	80.2	7	21	2	0	0	0	0	0	
July	0	0	12	30	43	2	0	0	75.2	69.6	73.4	72.0	94.1	96.1	96.1	83.3	76.8	18	18	0	0	0	0	0	0	
Aug.	5	13	20	28	25	1	0	0	73.8	72.8	74.6	73.7	95.6	96.4	96.4	82.9	82.9	13	13	4	0	0	0	0	0	
Sept.	3	17	20	18	4	4	0	3	67.9	70.2	69.9	69.3	96.3	96.3	96.3	82.9	82.9	17	17	10	0	0	0	0	0	
Oct.	23	13	12	10	4	4	0	3	57.4	60.2	59.8	59.1	90.5	87.6	84.8	81.6	81.6	7	14	16	0	0	0	0	0	
Nov.	40	8	7	4	26	6	5	6	54.1	55.4	55.1	54.9	91.8	73.0	88.3	84.4	84.4	5	19	7	0	0	0	0	0	
Dec.	29	5	4	4	26	6	5	6	54.1	55.4	55.1	54.9	91.8	73.0	88.3	84.4	84.4	5	19	7	0	0	0	0	0	
Sums ..	174	138	164	236	218	24	13	20	767.1	753.8	763.7	763.8	1105.0	784.9	1039.7	909.9	85.7	130	164	53	88	0	7	91	33	0
Percentages.																										
15.9 11.7 14.0 21.9 19.2 2.2 1.1 2.7 11.0 63.9 63.2 65.3 64.1 92.1 91.2 90.6 80.0 4.6 5.8 3.7 32.8 44.8 23.4 34.0 0 1.9 24.9 3.80.0																										
Means																										

NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond to 5.38 a. m., 1.38 p. m., and 9.38 p. m., local time. Correction for instrumental error of barometer used: From 5.38 a. m., January 1, to 9.38 p. m., December 31, 1884, inclusive, +.002 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, .060; February, .060; March, .060; April, .060; May, .060; June, .060; July, .060; August, .060; September, .060; October, .060; November, .060; December, .060.

JNO. MCGILLONE  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

BUFFALO, N. Y.

Location of office on December 31, 1884, Board of Trade building.

[Latitude, 42° 53' N.; longitude, 78° 53' W. Elevation of barometer above sea-level, 690 feet. Elevation of exposed thermometer above ground, 101 feet. Elevation of rain-gauge above ground, 108 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.								
Month.	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Mean maximum.	Mean minimum.	Total amount.	Any consecutive 8-hourly measurements.	Miles.	Direction from—	Date.	Maximum hourly velocity during month.	Prevailing direction.	Total movement.	
	7 a. m.	3 p. m.	11 p. m.							Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.												
1884.																										
Jan.....	28.337	28.295	28.317	28.316	28.051	27	28.574	2	1.477	16.7	19.6	17.7	18.0	45.7	30	13.5	50.2	25.2	10.9	3.36	79.8	W.	8	SW.	13.224	
Feb.....	28.268	28.264	28.270	28.267	28.843	15	28.554	19	1.289	25.1	24.1	25.6	24.8	55.0	10	7.4	29.6	82.4	4.03	37.28	50	W.	12	SW.	8.381	
Mar.....	28.268	28.248	28.260	28.257	28.633	16	28.710	26	1.023	27.1	33.2	28.7	29.8	60.9	23	2.0	1.62	9	88.8	22.4	1.05	11	SW.	8.008		
Apr.....	28.167	28.134	28.161	28.154	28.463	21	28.693	2	1.161	36.3	43.9	38.9	39.7	71.8	27	20.2	6.45	6	71.9	32.7	1.58	16	SW.	7.144		
May.....	28.181	28.166	28.177	28.175	28.605	8	28.658	2	1.632	50.1	55.6	51.2	52.1	78.9	22	35.8	3.41	60	44.7	3.92	67.7	28	SW.	7.477		
June.....	28.351	28.317	28.322	28.330	28.711	15	28.957	6	1.754	63.8	73.2	64.1	64.5	85.1	22	47.9	15.37	75.4	58.0	4.4	10	NE.	26	SW.	7.064	
July.....	28.145	28.118	28.127	28.130	28.811	8	28.815	31	1.096	63.8	67.4	64.2	64.9	83.5	3	53.0	11	83.5	71.8	53.0	11	44	SW.	28	SW.	7.180
Aug.....	28.299	28.270	28.283	28.284	28.690	9	28.661	29	1.239	63.8	73.1	63.7	67.5	87.8	16	46.8	25	41.5	73.8	60.3	23	39	SW.	28	SW.	9.185
Sept.....	28.349	28.308	28.325	28.327	28.787	14	28.916	28	0.871	62.6	70.5	63.8	65.6	78.5	10	40.4	14	48.1	62.4	58.4	1.71	34	SW.	28	SW.	8.998
Oct.....	28.284	28.257	28.260	28.271	28.787	25	28.916	8	0.841	49.4	53.1	48.6	52.0	82.1	4	24.7	26	47.8	69.3	47.4	1.64	27	SW.	28	SW.	8.998
Nov.....	28.284	28.257	28.296	28.292	28.663	8	28.661	28	1.002	38.0	41.1	38.6	37.8	67.9	10	10.6	24	50.4	43.6	2.01	69	23	W.	15	SW.	9.979
Dec.....	28.340	28.317	28.343	28.333	28.690	26	28.548	6	1.872	28.9	31.3	28.1	27.8	67.9	30	3.5	19	61.4	85.7	24.0	2.67	82	15	SW.	10.859	
Sums.....	351.387	351.051	351.241	351.226	30.051	27	28.463	12	11.567	322.0	590.1	537.1	549.6	688.1	110	13.5	525	49.3	53.5	537.07	9	64	15	SW.	94.573	
Means.....	28.282	28.254	28.270	28.269	28.643	27	28.463	12	1.904	43.5	49.2	44.8	45.8	88.1	110	13.5	525	49.3	53.5	537.07	9	64	15	SW.	94.573	

January.

April.

September.

## BUFFALO, N. Y.—Continued.

Month.	Wind at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—							Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).					Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Washington time.				Percentages.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
									7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Rain.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.53 a. m., 2.53 p. m., and 10.53 p. m., local time.

Corrections for instrumental error of barometer used: From 7 a. m., January 1, 1884, to 11 p. m., February 24, 1884, inclusive, +.007 inch; from 3 a. m., February 25, 1884, to 11 a. m., September 10, 1884, inclusive, +.012 inch (by order Lieut. Powell, inspector); from 3 p. m., September 10, 1884, to 11 p. m., December 31, 1884, inclusive, +.007 inch (approved U. S. O., September 17, 1884).

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, .790; February, .700; March, .760; April, .770; May, .740; June, .720; July, .720; August, .720; September, .730; October, .750; November, .770; December, .790.

REMARKS.—Last frost of season, March 23; first frost of season, September 19; aurora, March 23, from 8.10 p. m. to 10 p. m.

D. CUTHBERTSON  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

BUFORD, FORT, DAK.

Location of office on December 31, 1884, Post building.

[Latitude, 48° 0' N.; longitude, 103° 50' W. Elevation of barometer above sea-level, 1,980 (B) feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain-gauge above ground, 1 foot.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
Washington time.			Monthly mean.			Highest.			Date.			Lowest.			Date.			Range.			Washington time.			Self-registering ther- mometers.			Total amount.		Any 3 con- secutive 8-hourly measure- ments.		Maximum hourly velocity during month.		Prevailing direction.		Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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\* Four 7 a. m., five 3 p. m. and five 11 p. m. observations missed.

† January.

‡ February.

§ August.



## BUTFORD, FORT, DAK.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.				Washington time.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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\* Four 7 a. m., five 3 p. m., and five 11 p. m. observations missed.  
 NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.12 a. m., 1.12 p. m., and 8.12 p. m., local time.  
 Correction for instrumental error of barometer used: From 5.12 a. m., January 1, to 8.12 p. m., December 31, 1884, inclusive, +.021 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.260; February, 2.210; March, 2.160; April, 2.100; May, 2.060; June, 1.990; July, 1.960; August, 1.960; September, 2.020; October, 2.100; November, 2.160; December, 2.270.  
 REMARKS.—January, aurora 25th; snow from a cloudless sky 25th. March, aurora 19th, 20th, 21st, 28th. April, frost 1st, 2d, 3d, 8th, 6th, 17th, 19th, 26th. May, frost 1st, 2d, 8th. June, aurora 13th, 18th. September, first frost (light) 9th, 19th, and killing frost 30th; aurora 17th and 18th. October, aurora 9th and 16th; frost 4th, 7th, and 27th. November, frost 3d, 4th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th, 15th, 18th. December, frost 3d, 4th, 5th, 17th.

A. SCHNEIDER,  
 Corporal, Signal Corps, U. S. A.







## CANNY, FORT, WASH.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—								River.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Washington time.				Percentages.				Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Thunder-storms.	Aurora.	Highest.	Date.	Lowest.	Date.	Range.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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\* March.

\* January.

\* Two 3 p. m. observations missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 3.52 a. m., 11.52 p. m., and 7.52 p. m., local time.  
Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, inclusive — .003.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.20; February, 0.20; March, 0.20; April, 0.20; May, 0.20; June, 0.19; July, 0.19; August, 0.19; September, 0.20; October, 0.20; November, 0.20; December, 0.20.

JNO. F. HEMENWAY,  
Private, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884.—Continued.*

CAPE HENRY, VA.

Location of office on December 31, 1884, 50 yards east of light-house.

[Latitude, 36° 56' N.; longitude, 76° 0' W. Elevation of barometer above sea-level, 16 feet. Elevation of exposed thermometer above ground, 15 feet. Elevation of rain-gauge above ground, 6 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
	Washington time.					Monthly mean.	Washington time.					Self-registering thermometer.					Any 3 consecutive 8-hourly measurements.	Maximum hourly velocity during month.		Prevailing direction.		Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
	7 p. m.	3 p. m.	11 p. m.	Range.	Date.		Lowest.	Date.	Highest.	Date.	Range.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.		Total amount.	Date.	Miles.	Direction from —		Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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\* January.

† April.

‡ July.

## CAPE HENRY, VA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of claims.	Washington time.				Clondiness (in tenths).		Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
										7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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Note.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.04 a. m., 3.04 p. m., and 11.04 p. m., local time. Correction for instrumental error of barometer used: From 7.64 a. m., January 1, to 11.04 p. m., December 31, 1884, inclusive,  $-.016$  inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, .020; February, .020; March, .020; April, .020; May, .020; June, .020; July, .020; August, .020; September, .020; October, .020; November, .020; December, .020.

REMARKS.—January, heavy rains during month. February, lunar halo on 3d, 5th, and 13th. March, lunar halo on 4th; heavy rains during month. May, polar bands on 15th; lunar halo on 2d and 29th. June, meteor fell on 13th; solar halo on 24th. July, lunar halo on 29th; severe thunder-storms during month. August, lunar rainbow on 6th; lunar halo on 5th; three meteors fell on 19th. September, very dry weather during the month; solar halo on 4th, 6th, and 24th; lunar halo on 2d, 3d, 6th, and 28th. October, extremely dry weather during first of month; aurora on 1st from 10 to 11 p. m. November, solar halo on 27th; lunar halo on 25th and 27th. December, distant lightning on 15th; rainbow on 31st; solar halo on 23d; lunar halo on 4th and 31st.

WM. DAVIS

Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

CAPE MAY, N. J.

Location of office on December 31, 1884, Bay Side.

[Latitude, 38° 59' N.; longitude, 74° 58' W. Elevation of barometer above sea-level, 27 feet. Elevation of exposed thermometer above ground, 18 feet. Elevation of rain-gauge above ground, 6 feet.]

Barometer readings (corrected for temperature and instrumental error only).															Temperature.						Precipitation.			Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Month.	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.			Monthly mean.	Self-registering thermometers.					Mean maximum.	Mean minimum.	Any 3 consecutive 8-hourly measurements.	Maximum hourly velocity during month.			Prevailing direction.	Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.		Maximum.	Date.	Minimum.	Date.	Absolute range.				Maximum.	Minimum.	Total amount.			Direction from—	Miles.	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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\*January.

†February.

‡July.

§December.



## CAPE MAY, N. J.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.			Relative humidity (per cent.).			Cloudiness (in tenths).			Number of days—											
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Washington time.			Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunder-storms.	Aurora.	
										7 a. m.	3 p. m.	11 p. m.																		
1884.																														
Jan.....	11	9	7	2	15	14	5	30	0	24.5	27.5	28.1	28.0	80.1	78.6	81.2	80.0	6.0	7.6	5.0	6.2	6	14	11	16	7	25	0	0	0
Feb.....	4	13	16	8	16	3	7	20	0	33.7	37.4	33.9	35.0	84.8	83.1	84.0	84.0	6.1	5.2	5.3	5.6	5	16	8	17	8	11	0	1	0
Mar.....	5	14	9	10	12	1	11	30	1	33.5	36.3	35.1	35.0	84.6	80.4	83.6	82.9	5.1	4.7	4.2	5.0	9	14	8	17	8	0	0	2	0
Apr.....	7	7	10	8	7	4	16	29	2	39.5	43.8	41.6	41.6	79.1	76.1	81.7	79.0	6.3	5.9	5.7	5.6	5	15	10	15	0	0	0	1	0
May.....	4	7	4	13	28	9	10	18	0	51.5	52.2	51.1	51.0	81.0	68.8	78.8	78.2	4.3	4.7	4.1	4.4	18	12	6	6	0	0	0	0	0
June.....	0	18	14	16	25	4	4	7	2	60.3	61.8	60.6	60.9	82.6	71.1	85.5	78.8	4.2	4.2	3.4	3.9	16	7	7	6	0	0	0	0	0
July.....	6	19	10	14	27	6	2	7	2	64.2	67.4	66.2	65.9	82.6	74.9	88.0	80.9	4.8	4.9	5.5	6.1	7	19	5	10	0	0	0	0	0
Aug.....	6	19	10	14	27	6	2	7	2	67.4	68.7	66.9	67.7	88.0	78.1	88.5	84.9	5.3	5.0	4.8	5.0	10	12	5	9	0	0	0	0	0
Sept.....	6	7	6	8	35	19	2	7	0	50.9	54.4	51.5	52.3	83.3	73.3	80.7	79.1	1.5	2.7	1.8	2.0	21	7	2	4	0	0	0	0	0
Oct.....	17	9	8	5	19	16	7	12	0	62.6	65.8	63.1	63.8	77.4	72.9	77.5	76.9	3.8	4.0	3.8	3.9	14	13	4	9	0	0	0	0	0
Nov.....	8	12	3	6	8	14	15	22	2	39.2	43.4	41.2	41.3	79.0	74.4	79.5	77.6	3.6	4.9	3.7	4.1	14	10	6	10	0	0	0	0	0
Dec.....	25	7	5	5	12	13	7	18	1	32.4	36.0	33.7	34.0	79.9	78.7	79.4	79.3	6.5	6.7	6.2	6.5	7	8	16	9	3	12	0	1	0
Sums ..	97	126	100	105	230	112	96	221	11	539.7	594.7	571.0	575.1	982.5	910.4	985.5	959.6	56.5	61.5	53.5	57.2	127	147	92	122	14	56	0	15	0
Means ..	Percentages.								Percentages.				Percentages.				Percentages.													
	8.3	11.5	9.1	9.6	20.9	10.2	8.7	20.1	1.0	46.6	49.6	47.6	47.9	81.9	75.9	82.1	80.0	4.7	5.1	4.5	4.8	34.7	40.2	25.1	33.3	3.8	15.3	0.4	1.0	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.08 a. m., 3.08 p. m., and 11.08 p. m., local time.  
 Correction for instrumental error of barometer used: From 7.08 a. m., January 1, to 11.08 December 31, 1884, inclusive, —.002 inch.  
 The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.030; February, 0.030; March, 0.030;  
 April, 0.030; May, 0.030; June, 0.030; July, 0.030; August, 0.030; September, 0.030; October, 0.030; November, 0.030; December, 0.030.  
 REMARKS.—Last frost, March 16; first frost, October 10. Last snow, March 5; first snow, December 18.

W. EASBY SMITH,  
*Private, Signal Corps, U. S. A.*

*Meteorological summary for the year ending December 31, 1884—Continued.*

CAPE MENDOCINO, CAL.

Location of office on December 31, 1884, on mountain east of light-house.

[Latitude, 40° 20' N.; longitude, 124° 24' W. Elevation of barometer above sea-level, 837 feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain gauge, above ground, 1 foot.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.				Precipitation.			Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
Month.	Washington time.			Monthly mean.			Lowest.	Date.	Range.	Self-registering thermometers.				Mean maximum.	Mean minimum.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.	Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	7 a.m.	3 p.m.	11 p.m.	7 a.m.	3 p.m.	11 p.m.				Monthly mean.	Maximum.	Date.	Minimum.			Date.	Absolute range.			Total amount.	Largest amount.	Date.	Miles.	Direction from—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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## CAPE MENDOCINO, CAL.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time; Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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## Percentages.

Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
31.1	41.3	27.6	28.4	0	0.8	0	0	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 3.51 a. m., 11.51 a. m., and 7.51 p. m., local time. Corrections for instrumental error of barometer used: From 3.51 a. m., January 1 to 7.51 p. m., September 30, inclusive, +.041 inch; from 3.51 a. m., October 1 to 7.51 p. m., December 31, inclusive, +.056 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.700; February, 0.700; March, 0.680; April, 0.680; May, 0.680; June, 0.680; July, 0.680; August, 0.680; September, 0.680; October, 0.680; November, 0.700; December, 0.700.

REMARKS.—Instrumental error of barometer No. 346 changed by authority L. R., dated O. C. S. O., September 24, 1884.

A. P. LEAVITT,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

CEDAR KEYS, FLA.

Location of office on December 31, 1884, rooms Nos. 8 and 9, northwest corner of Second and C streets.

[Latitude, 26° 8' N.; longitude, 83° 2' W. Elevation of barometer above sea-level, 22 feet. Elevation of exposed thermometer above ground, 20 feet. Elevation of rain-gauge above ground, 35 feet.]

Month.	Barometric readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.				Wind.				Total movement.
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.			
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.								Date.	Absolute range.	
1884.																									
Jan.....	30.241	30.181	30.234	30.219	30.561	21.29	763	7.08	46.9	56.3	51.6	51.6	27.25	2	1.35	1.17	1	35	NW.	2	NW.	6.859			
Feb.....	30.147	30.092	30.129	30.123	30.323	10.29	785	5.38	59.4	68.3	62.5	63.4	12.37	29	60.8	69	17	40	SW.	20	S.	6.188			
Mar.....	30.106	30.066	30.092	30.084	30.341	4.29	880	5.11	62.3	71.3	68.6	69.7	22.42	2	73.1	77	14	40	SW.	19	S.	8.020			
Apr.....	30.001	29.974	29.988	29.987	30.206	29.29	613	5.93	63.0	73.5	68.4	69.0	18.50	7	82.7	35	5	36	SW.	2	W.	7.586			
May.....	30.016	29.987	30.008	30.003	30.197	3.29	819	8.78	74.5	81.5	75.0	77.0	21.60	5	82.7	91	18	31	SW.	23	SW.	7.006			
June.....	30.009	29.965	29.989	29.985	30.143	27.29	742	40.7	75.0	83.1	78.5	78.2	26.62	0	84.7	2	29	36	SE.	23	SW.	6.885			
July.....	30.008	29.972	29.987	29.980	30.132	24.29	826	8.06	80.8	85.9	80.7	82.5	8.20	70	87.8	20	1	36	NE.	21	W.	6.811			
Aug.....	30.013	29.971	30.018	30.010	30.167	19.29	829	8.38	78.4	84.3	79.0	80.3	3.69	9	88.1	20	5	22	SW.	30	NE.	5.002			
Sept.....	30.043	30.090	30.046	30.026	30.203	26.29	876	1.32	76.4	84.0	78.6	80.3	1.2	766.9	16	23.1	86.9	73.2	3.63	129	10	NE.	6.281		
Oct.....	30.075	30.015	30.073	30.054	30.207	24.29	883	1.44	69.3	81.0	72.5	74.3	9.52	7	86.9	27	21	26	NE.	15	NE.	7.285			
Nov.....	30.087	30.030	30.086	30.068	30.225	11.29	707	5.18	59.2	62.6	63.7	63.0	3.42	0	71.8	23	5	31	S.	28	N.	6.002			
Dec.....	30.134	30.080	30.120	30.111	30.316	19.29	782	5.34	57.0	65.2	59.9	60.7	30.32	19	68.6	71.8	56.9	3.06	1.73	27	31	N.	5.774		
Sum.....	360.981	360.922	360.768	360.631	360.631	15	785	5.88	804.0	897.6	833.9	848.6	13.25	2	977.9	57.68	.....	.....	.....	.....	.....	.....	70.147		
Means.....	30.072	30.027	30.064	30.054	30.561	21.29	613	4.74	67.0	73.6	69.5	70.7	9.25	6	77.3	64.2	.....	.....	.....	.....	.....	.....	.....		

\* January.

† April.

‡ August.

## CEDAR KEYS, FLA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.	Relative humidity (per cent.).	Cloudiness (in tenths).					Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.			Number of calm.	Washington time.					Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunder-storms.	Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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Jan.....	9	18	0	2	14	4	14	22	1	42.0	49.7	46.8	46.5	83.9	83.3	79.3	83.0	83.3	3.6	15	11	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0</

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6:36 p. m., 2:36 p. m., and 10:36 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1 to 11 p. m., December 31, 1884, inclusive, + .002 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, .020; February, .020; March, .020; April, .020; May, .020; June, .020; July, .020; August, .020; September, .020; October, .020; November, .020; December, .020.

REMARKS.—January 6, 1884, was the coldest day (+25.2) for many years. Orange trees were killed throughout a great portion of the state, causing immense losses.

A. J. MITCHELL,  
Private, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

CHARLESTON, S. C.

Location of office on December 31, 1884, corner East Bay and Broad streets.

[Latitude, 32° 47' N.; longitude, 79° 56' W. Elevation of barometer above sea-level, 52 feet. Elevation of exposed thermometer above ground, 40 feet. Elevation of rain-gauge above ground, 33 feet.]

Month.	Barometric readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.			Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	Washington time.			Monthly mean.			Washington time.			Self-registering ther- mometers.			Total amount.		Any 3 con- secutive 8 hourly measure- ments.		Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	7 a. m.	3 p. m.	11 p. m.	Date.	Range.	Lowest.	Highest.	Date.	Minimum.	Absolute range.	Mean maximum.	Mean minimum.	Largest amount.	Date.	Miles.	Direction from—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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## CHARLESTON, S. C.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m.; Washington time: Number of times observed blowing from—								Dew-point		Relative humidity (per cent.).		Cloudiness (in tenths).				Number of days—									
	Number of calms.								Washington time.																	
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 82°.	Minimum below 82°.	Maximum below 80°.	Thunder-storms.	Aurora.	
1884.																										
Jan.....	10	13	8	1	2	27	15	16	38.3	40.1	39.4	39.3	85.6	87.0	79.9	77.5	5.4	10	11	10	12	1	7	0	0	
Feb.....	2	12	9	4	4	25	15	7	50.2	50.8	51.6	50.9	86.2	85.5	81.8	77.8	4.4	11	14	4	10	0	1	0	0	
Mar.....	4	11	13	3	8	35	13	9	50.0	52.4	53.8	52.1	83.2	87.1	83.9	78.1	4.0	12	9	9	12	0	0	4	0	
Apr.....	6	7	10	2	1	34	18	11	51.2	50.9	54.6	52.2	77.6	57.7	77.9	71.1	4.9	10	11	9	11	0	0	0	0	
May.....	2	10	19	5	6	30	16	2	65.4	64.7	66.4	65.5	81.3	60.0	81.9	74.4	6.2	7	18	5	11	0	0	1	0	
June.....	2	17	30	9	5	24	0	1	68.4	68.8	69.4	68.9	85.8	70.8	85.5	80.7	4.2	4	15	5	6	0	0	1	0	
July.....	3	4	11	2	6	53	11	1	73.8	73.5	73.6	73.6	84.2	64.7	81.9	76.9	7.1	3	14	18	14	0	0	2	0	
Aug.....	4	25	20	3	1	19	9	3	71.2	71.8	72.9	72.0	87.3	68.8	84.7	80.3	5.2	6	19	6	18	0	0	1	0	
Sept.....	4	29	34	1	3	8	3	2	70.5	71.4	71.2	71.0	91.5	71.1	84.7	82.4	3.6	13	14	3	6	0	0	1	0	
Oct.....	7	36	32	0	0	9	4	4	62.6	62.6	63.6	62.9	86.1	63.8	81.5	77.1	3.3	16	12	3	6	0	0	1	0	
Nov.....	17	18	12	2	1	9	13	18	50.2	50.2	50.6	49.8	79.2	61.3	76.8	72.4	3.4	15	10	5	8	0	0	1	0	
Dec.....	22	26	8	0	2	17	8	4	45.4	49.8	48.4	47.9	85.8	75.0	84.3	81.7	6.4	7	12	11	0	2	0	0	0	
Sums....	53	208	206	32	34	290	125	78	693.6	707.3	715.4	705.6	1013.8	702.8	984.6	930.4	60.2	113	164	87	124	1	10	14	36	0
Percentages.																				Percentages.						
7.619, 0.18, 8.2, 9.3, 12.6, 5.1, 4.7, 1.3, 6.0										4.8, 31.0, 45.0, 24.0, 33.9, .8										2.7, 3.89, .8, 0						
Means																										

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.48 a. m., 2.48 p. m., and 10.48 p. m., local time.

Correction for instrumental error of barometer used: From 6.48 a. m., January 1, to 10.48 p. m., December 31, 1884, inclusive, —.028.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, .060; February, .060; March, .060; April, .060; May, .050; June, .050; July, .050; August, .050; September, .050; October, .060; November, .060; December, .060.

J. H. SMITH,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

CHARLOTTE, N. C.

Location of office on December 31, 1884, third floor Traders' National Bank.

[Latitude, 35° 13' N.; longitude, 80° 51' W. Elevation of barometer above sea-level, 808 feet. Elevation of exposed thermometer above ground, 35 feet. Elevation of rain-gauge above ground, 47 feet.]

Barometer readings (corrected for temperature and instrumental error only).														Temperature.						Precipitation.		Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
Washington time.				Monthly mean.				Highest.		Lowest.		Date.		Range.		7 a. m.		3 p. m.		11 p. m.		Monthly mean.		Self-registering thermometers.		Mean maximum.		Mean minimum.		Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
7 a. m.		3 p. m.		11 p. m.		In.		In.		In.		In.		In.		7 a. m.		3 p. m.		11 p. m.		In.		Maximum.		Minimum.		Date.		Absolute range.		Mean maximum.		Mean minimum.		Total amount.		Largest amount.		Date.		Miles.		Direction from—		Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.	

201 days

January.

April.

July.



CHARLOTTE, N. C.--Continued.

[illegible]

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.45 a. m., 2.45 p. m., 10.45 p. m., local time.

Corrections for instrumental error of barometer used: From 7 a. m., August 31, inclusive,  $-.003$  inch; from 7 a. m., September 1, to 11 p. m., December 31, 1884, inclusive,  $+.007$  inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.880; February, 0.890; March, 0.880; April, 0.860; May, 0.840; June, 0.830; July, 0.830; August, 0.839; September, 0.840; October, 0.860; November, 0.880; December, 0.890.

**D. O'DONOGHUE,**  
*Sergeant, Signal Corps, U. S. A.*

*Metereological summary for the year ending December 31, 1884—Continued.*

CHATTANOOGA, TENN.

Location of office on December 31, 1884, northeast corner third floor Hamilton County court-house.

[Latitude, 35° 4' N.; longitude, 85° 19' W. Elevation of barometer above sea-level, 783 feet. Elevation of exposed thermometer above ground, 43 feet. Elevation of rain-gauge above ground, 59 feet.]

Barometer readings (corrected for temperature and instrumental error only).														Temperature.				Precipitation.			Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Month.	Washington time.			Monthly mean.	Self-registering thermometers.				Total amount.	Any 3 consecutive 8-hourly measurements.	Maximum hourly velocity during month.	Prevailing direction.	Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	Washington time.				Self-registering thermometers.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
	7 a. m.	11 p. m.	3 p. m.		Range.	Date.	Lowest.	Highest.						Monthly mean.	7 a. m.	11 p. m.	3 p. m.	Mean maximum.	Mean minimum.	Date.	Direction from—	Miles.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In

\* January.

† November.

‡ August.

CHATTANOOGA, TENN.—Continued.

[illegible]

**October.**

**March.**

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 0627 a. m., 2.27 p. m., and 10.27 p. m., local time. Corrections for instrumental error of barometer used: From 6.27 a. m., January 1, to 2.27 p. m., March 29, inclusive, +.003 inch; from 6.27 p. m., March 29, to 10.27 p. m., December 31, 1884, inclusive, —.012 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.860; February, 0.860; March, 0.859; April, 0.830; May, 0.810; June, 0.810; July, 0.800; August, 0.800; September, 0.810; October, 0.830; November, 0.830; December, 0.860.

**REMARKS.**—Flood in Tennessee River passed danger line (33 feet) March 8; reached highest point since 1875 (48 feet) on March 11, and subsided below danger line March 15. Heated term in October of unusual intensity; maximum temperature over 90° on 3d, 4th, 5th, and 6th. A remarkably heavy aleet storm December 21, coating exposed objects with ice half-inch thick.

**B. L. GOULDING,**  
*Sergeant, Signal Corps, U. S. A.*

*Meteorological summary for the year ending December 31, 1884—Continued.*

CHEYENNE, WYO.

Location of office on December 31, 1884, Commercial Building.

[Latitude, 41° 8' N.; longitude, 106° 48' W. Elevation of barometer above sea-level, 6,108 feet. Elevation of exposed thermometer above ground, 58 feet. Elevation of rain-gauge above ground, 50 feet.]

Barometer readings (corrected for temperature and instrumental error only).														Temperature.										Precipitation.				Wind.																																																																																																																																																																																																																																																																																																																																																																																																					
Month.	Washington time.				Monthly mean.	High.	Date.	Lowest.	Date.	Range.	Washington time.				Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Any 8 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.	Miles.																																																																																																																																																																																																																																																																																																																																																																																																				
	7 a. m.	3 p. m.	11 p. m.	7 a. m.							3 p. m.	11 p. m.	7 a. m.	3 p. m.										11 p. m.	7 a. m.	3 p. m.	11 p. m.			7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.

• October.

† March.

‡ June.

§ February.

## CHEYENNE, WYO.—Continued.

Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—										Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).				Number of days—																	
Month.	Number of calms.										7 a. m.		3 p. m.		11 p. m.		Mean.		7 a. m.		3 p. m.		11 p. m.		Mean.		Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 30°.	Thunder-storms.	Aurora.
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.																											
	1884.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Sums	Percentages.	11.2	6.9	2.9	6.7	13.5	8.4	14.4	34.6	1.4	3.7	47.8									
128	76	32	74	148	92	158	380	15	297.6	278.6	314.5	297.0	813.7	671.7	782.3	671.7	38.9	53.3	41.5	43.6	175	129	63	101	42	191	1	29	0						
Means ..																																			

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.09 a. m., 1.09 p. m., and 9.09 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11.03 p. m., December 31, 1884, inclusive, .000 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, .6270; February, .6270; March, .6200; April, .6020; May, .5890; June, .5760; July, .5710; August, .5720; September, .5880; October, .6040; November, .6230; December, .6300.

EDGAR MCGOVERN,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

CHICAGO, ILL.

Location of office on December 31, 1884, Major Block, corner of Madison and La Salle streets.

[Latitude, 41° 52' N.; longitude, 87° 39' W. Elevation of barometer above sea-level, 561 feet. Elevation of exposed thermometer above ground, 70 feet. Elevation of rain-gauge above ground, 83 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.		Total movement.					
Washington time.			Monthly mean.			Washington time.			Self-registering thermometers.						Any 3 consecutive 8-hourly measurements.	Total amount.	Maximum hourly velocity during month.		Prevailing direction.										
7 a. m.	3 p. m.	11 p. m.	In.	Lowest.	Date.	Range.	Monthly mean.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Date.	Minimum.	Absolute range.			Mean maximum.	Mean minimum.		Date.	Miles.	Direction							
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	Miles.						
Jan.	29.407	29.401	29.423	29.410	29.926	26	28.759	13	1.167	16.6	23.0	17.9	19.2	49.3	30	18.5	5	67.8	26.5	11.1	1.39	39	1, 2	26	W.	6,713			
Feb.	29.304	29.280	29.298	29.294	29.758	15	28.702	19	1.054	24.8	30.5	27.7	27.7	53.0	19	2	29	55.8	35.4	41.1	2.27	13	12	26	NW.	5,413			
Mar.	29.307	29.280	29.294	29.294	29.739	30	28.642	25	1.097	30.5	38.0	34.1	34.2	59.2	27	9	4	40.1	41.1	27.8	5.168	20	25	28	SW.	6,168			
Apr.	29.236	29.220	29.231	29.229	29.653	21	28.559	15	1.094	41.1	47.4	44.4	44.3	77.2	30	31	0	2	46.3	50.7	37.9	8.051	74	15	36	W.	6,364		
May	29.237	29.225	29.227	29.230	29.665	20	28.784	1	1.081	53.4	61.0	55.7	56.7	86.4	22	40	0	2	38.0	68.9	48.3	1.53	08	1	25	NW.	6,016		
June	29.351	29.320	29.324	29.332	29.570	14	28.864	9	1.596	62.6	68.6	63.4	65.0	86.4	23	47	0	11	39.4	71.1	57.3	2.11	46	1, 2	23	NW.	4,496		
July	29.227	29.211	29.207	29.215	29.488	20	28.898	9	1.552	66.1	73.1	63.4	69.2	89.2	22	53	8	6	35.3	75.2	62.0	3.71	1	1	24	NE.	4,293		
Aug.	29.310	29.318	29.318	29.325	29.653	9	28.873	26	1.630	65.5	73.8	63.8	68.6	91.2	19	51	1	10	40.1	74.9	61.7	2.50	1	27	20	SW.	4,996		
Sept.	29.327	29.280	29.302	29.307	29.712	13	28.810	24	1.902	64.2	73.7	63.8	68.9	83.7	9	50	6	21	38.1	75.5	63.0	2.29	1	27	24	W.	5,800		
Oct.	29.116	29.890	29.392	29.396	29.816	14	29.084	5	1.732	51.6	61.5	56.1	58.4	83.4	2, 5	27	23	55.7	64.2	48.6	3.50	1	30	7	35	SW.	5,745		
Nov.	29.358	29.345	29.359	29.359	29.741	6	28.677	23	1.064	35.5	44.0	39.3	39.6	64.4	9	5	4	24	59.0	48.6	23.1	1.80	82	3, 4	22	NW.	5,441		
Dec.	29.370	29.353	29.356	29.360	29.683	25	28.576	6	1.317	28.4	31.0	28.8	28.4	61.2	30	11	2	19	72.4	37.8	22.2	4.21	83	28	29	SW.	6,574		
Sum.	351.677	351.626	351.731	351.745	.....	.....	111.128	836.3	625.1	573.5	578.4	.....	.....	.....	.....	.....	.....	.....	608.0	965.1	491.8	34.61	.....	.....	.....	68,018			
Means	29.323	29.302	29.311	29.312	29.926	126	28.559	15	1.927	44.7	52.1	47.8	48.2	91.2	119	18.5	15	50.7	55.4	41.0	.....	.....	.....	.....	.....	.....	.....	SW.	.....

\* One 7 a. m. observation missed. † See letter received, 485, observation, 1885. ‡ January. § April. || August.

## CHICAGO, ILL.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calm.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunderstorms.	Aurora.
1884.																														
Jan.....	6	4	2	3	6	28	31	10	0	16.9	21.3	67.3	69.9	63.6	6.2	1.1	3.9	9	13	0	9	13	18	29	0	0	0	0	0	
Feb.....	4	16	9	5	16	7	16	18	2	22.7	26.0	62.7	67.9	67.7	5.9	6.9	4.8	6.5	4	11	14	16	8	28	0	0	0	0	0	
Mar.....	19	12	10	6	13	4	5	10	11	33.4	42.6	58.9	69.2	67.6	4.8	6.9	4.8	5.9	0	9	0	12	0	1	0	0	0	0	0	
Apr.....	21	11	24	4	4	5	10	11	0	43.9	44.8	57.1	67.1	65.5	4.8	5.6	3.3	4.6	0	17	0	9	0	0	0	0	0	0	0	
May.....	24	17	10	6	6	6	9	4	0	55.0	56.0	68.5	77.7	73.0	6.1	5.5	3.3	5.0	0	12	0	10	0	0	0	0	0	0	0	
June.....	24	11	17	6	6	6	9	4	0	55.0	58.1	61.0	72.6	69.9	5.3	4.7	2.5	4.7	0	25	4	9	0	0	0	0	0	0	0	
July.....	13	13	15	4	11	10	13	18	1	55.0	57.4	66.0	72.6	69.9	4.3	4.2	2.5	3.3	15	12	4	0	0	0	0	0	0	0	0	
Aug.....	7	14	18	5	19	8	10	8	0	57.5	58.5	67.4	71.1	68.3	3.9	3.6	2.6	3.6	3.7	15	9	6	0	0	0	0	0	0	0	
Sept.....	8	8	14	4	22	21	12	2	0	44.6	46.7	60.0	70.9	68.3	4.4	4.3	2.6	4.3	4.3	14	11	6	10	0	0	0	0	0	0	
Oct.....	9	8	7	7	15	27	20	6	0	33.7	32.2	68.1	78.3	73.3	5.7	7.2	3.9	4.6	9	14	7	9	2	9	0	0	0	0	0	
Nov.....	0	4	2	9	21	19	19	19	0	21.0	24.1	73.6	80.4	78.6	8.1	7.2	3.9	7.4	9	18	18	10	20	0	0	0	0	0	0	
Dec.....	0	4	2	9	21	19	19	19	0	21.0	24.1	73.6	80.4	78.6	8.1	7.2	3.9	7.4	9	18	18	10	20	0	0	0	0	0	0	
Sums ..	142	106	129	66	161	178	171	129	16	449.3	470.3	759.0	883.5	842.9	67.8	70.4	50.0	62.8	106	153	106	135	47	100	1	20	0	0	0	
										Percentages.										Percentages.										
Means ..	12.9	9.7	11.7	6.0	14.7	16.2	15.6	11.7	1.5	37.4	38.2	63.2	71.5	70.2	5.6	5.9	4.2	5.2	26.0	41.9	29.0	36.9	12.8	27.3	.355	0	0	0	0	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.18 a. m., 2.18 p. m., and 10.18 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, inclusive, —.001 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.750; February, 0.750; March, 0.740; April, 0.730; May, 0.700; June, 0.690; July, 0.690; August, 0.690; September, 0.690; October, 0.710; November, 0.740; December, 0.760.

REMARKS.—Frequent halos during first ten days of January; heavy rain February 12; heavy rain March 25; heavy snow April 20, severe gale 27; severe frost May 29; heavy frost October 23 (first frost for season); thunder-storm November 16; cold spell December 16 to 27.

T. B. JENNINGS,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

CHIMO, FORT, UNGAVA BAY, LABRADOR.

[Latitude, 59° N.; longitude, 69° W. Elevation of barometer above sea-level, 126 feet. Elevation of exposed thermometer above ground, — feet. Elevation of rain-gauge above ground, — feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.				Total movement							
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Mean maximum.	Mean minimum.	Total amount.	Any 8 consecutive 8-hourly measurements.	Maximum hourly velocity during month.				Prevailing direction.						
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.					Minimum.	Date.	Absolute range.								
1884.	In.			In.			In.																							Miles.
Jan.	29.778	29.761	29.785	29.775	30.593	27.28	28.44	28.153	23.5	19.6	23.8	22.3	17.0	10	50.0	22.67.0	15.5	31.9	78.64	10	N.	58	3	SW.	11	SW.	10	SW.	7, 017	
Feb.	29.861	29.843	29.878	29.861	30.653	27.28	28.81	28.167	19.3	13.1	18.5	17.0	30.0	20	35.0	(1) 65.0	8.7	25.7	70.17	20	SW.	58	11	SW.	22	SW.	8	SW.	10, 241	
Mar.	29.914	29.890	29.935	29.923	30.569	27.28	29.07	28.148	12.7	2.5	11.1	8.8	23.0	29	41.0	3.69.0	1.0	21.4	17.51	13	NW.	61	22	SW.	20	NE.	4	SW.	8, 892	
Apr.	30.055	30.067	30.093	30.072	30.867	29.29	30.60	29.917	17.9	23.5	15.7	12.0	32.0	20	13.0	13.65.0	26.7	7.2	84.39	17	SW.	36	3	SW.	27	N.	.....	.....	4, 716	
May	29.863	29.861	29.867	29.864	30.429	7.28	24.0	3.1.189	34.7	43.4	32.7	36.9	12.0	20	10.0	1.62.0	45.6	25.2	02.54	4	Gale.	17	3	SW.	12	SW.	.....	.....	.....	
June	29.713	29.701	29.704	29.706	30.216	1.13	28.2	21.2	40.7	46.6	38.7	42.0	74.0	17	25.0	4.549.0	50.2	31.3	5.46	11	12	Gale.	23	SW.	4	SW.	.....	.....	.....	
July	29.835	29.820	29.838	29.831	30.425	8.28	4.83	1.942	53.4	62.1	47.0	54.9	86.0	14	27.0	8.59.0	68.8	39.2	1.40	57	28	Gale.	28	SW.	10	NW.	.....	.....	.....	
Aug.	29.739	29.723	29.731	29.731	30.108	22.29	132.10	.876	48.6	57.5	43.2	49.8	86.0	6	23.0	23.57.0	61.8	37.2	3.28	98	1	Storm.	10	SW.	.....	.....	.....	.....	.....	
Sept.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oct.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nov.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dec.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sum.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Means.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

† 8, 8, 10, 11, 18.  
† For 24 days.  
• For 26 days.

\* For 25 days.

† For 24 days.

‡ 8, 9, 10, 11, 12.





*Meteorological summary for the year ending December 31, 1884—Continued.*

CHINCOTEAGUE, VA.

Location of office on December 31, 1884, Front street, near town hall.

[Latitude, 37° 59' N.; longitude, 75° 28' W. Elevation of barometer above sea-level, 8 feet. Elevation of exposed thermometer above ground, 23 feet. Elevation of rain-gauge above ground, 26 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.			Wind.				Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Range.	Washington time.			Self-registering thermometer.				Mean maximum.	Mean minimum.	Total amount.	Any 8 consecutive hourly measurements.	Maximum hourly velocity during month.			Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	7 a. m.	3 p. m.	11 p. m.						7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.					Date.	Absolute range.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
1884.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			

\*January.

†April.

‡July.

## CHINCOTEAGUE, VA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—									
	Number of calms.								Washington time.				Washington time.				Washington time.				Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.	
									North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	3 p. m.	11 p. m.	Mean.										7 a. m.
1884.																														
Jan.....	23	12	1	4	13	9	6	24	1	26.4	28.1	28.2	27.9	84.3	80.2	84.5	83.0	6.3	6	16	9	15	6	24	0	0	0	0	0	
Feb.....	11	10	12	6	18	47	0	18	0	37.9	38.5	37.8	38.1	90.1	83.6	89.1	87.6	6.1	4	19	6	21	1	10	0	0	0	0	0	
Mar.....	17	15	4	17	14	4	1	81	0	35.8	38.1	36.4	36.8	85.6	78.6	82.8	82.3	4.5	12	10	9	18	1	8	0	0	0	0	0	
Apr.....	11	10	10	12	8	11	0	33	0	40.1	41.6	42.0	41.2	79.0	68.0	83.8	76.9	5.0	13	13	8	13	0	0	0	0	0	0	0	
May.....	7	7	5	12	23	22	2	15	0	53.5	53.2	55.0	53.9	81.5	65.1	80.5	77.7	4.5	10	13	6	7	0	0	0	0	0	0	0	
June.....	1	13	11	15	29	14	3	4	0	64.4	64.4	63.2	64.0	90.3	74.4	91.4	85.4	4.2	10	14	6	7	0	0	0	0	0	0	0	
July.....	13	1	6	10	28	15	3	17	0	66.9	66.8	68.3	67.3	87.7	71.7	91.7	83.7	5.5	5	19	7	10	0	0	0	0	0	0	0	
Aug.....	6	21	9	20	9	21	3	4	0	70.1	69.4	69.2	69.6	84.6	78.1	94.8	89.2	6.7	6	16	7	18	0	0	0	0	0	0	0	
Sept.....	8	10	8	11	20	21	2	4	1	65.0	64.3	63.9	64.4	87.0	67.0	83.0	79.2	3.8	11	11	1	9	0	0	0	0	0	0	0	
Oct.....	21	9	5	13	21	8	2	13	1	53.5	51.7	55.5	54.6	81.3	66.9	83.3	77.2	3.6	14	13	4	7	0	0	0	0	0	0	0	
Nov.....	20	15	2	10	6	12	3	22	0	40.6	42.4	42.2	41.7	84.7	68.2	80.8	77.9	2.9	6	14	6	10	3	0	0	0	0	0	0	
Dec.....	23	19	2	7	5	18	5	13	1	33.3	37.2	35.8	35.4	83.8	77.9	84.7	82.1	6.6	14	14	12	19	3	0	0	0	0	0	0	
Sums..	151	142	70	137	199	172	30	193	4	587.5	599.7	597.5	594.9	1,029.9	879.7	1,037.0	982.2	56.7	118	164	84	149	11	55	2	8	0	0	0	
Percentages.																														
Means.	13.8	12.9	6.4	12.5	18.1	15.7	2.7	17.6	4.4	49.0	50.0	49.8	49.6	85.8	73.3	86.4	81.8	4.7	32.2	44.8	23.0	40.7	3.0	15.0	0.5	2.2	0	0	0	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.07 a. m., 3.07 p. m., and 11.07 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.013 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.010; February, 0.010; March, 0.010; April, 0.010; May, 0.010; June, 0.010; July, 0.010; August, 0.010; September, 0.010; October, 0.010; November, 0.010; December, 0.010.

REMARKS.—No remarkable meteorological phenomena occurred during the year. The elevation of station barometer was changed on the night of the 31st of May, after the 11 p. m. observations; authority, letter dated Office Chief Signal Officer, May 24, 1884.

CHAS. F. DICKENS,  
Private, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

CINCINNATI, OHIO.

Location of office on December 31, 1884, Pike's Opera House, West Fourth-street.

[Latitude, 39° 0' N.; Longitude, 84° 30' W. Elevation of barometer above sea-level, 620 feet. Elevation of exposed thermometer above ground, 68 feet. Elevation of rain-gauge above ground, 76 feet.]

Barometer readings (corrected for temperature and instrumental error only).														Temperature.						Precipitation.		Wind. &							
Month.	Washington time.			Monthly mean.			Date.	Lowest.	Range.	Washington time.			Self-registering ther- mometers.			Mean maximum.		Any 3 con- secutive 8-hourly measure- ments.	Total amount.	Maximum hourly velocity during month.		Prevailing direction.	Total movement.						
	7 p. m.	3 p. m.	11 p. m.	Date.	Highest.	Date.				Lowest.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.			Absolute range.	Mean maximum.			Mean minimum.	Largest amount.	Date.	Miles.	Direction from—	
1884.																													
Jan.	29.559	29.511	29.588	29.566	30.092	26	29.092	1	1.092	22.8	31.1	26.2	26.759.7	31	—	5	69.4	33.9	18.8	2.21	0.40	18.19	24	SW.	2	SW.	4.542	2	SW.
Feb.	29.406	29.366	29.387	29.366	29.883	15	28.738	10	1.145	37.9	45.4	40.4	41.266.9	12	6.4	29	60.5	50.0	33.8	8.87	2.50	5.6	25	W.	9	NW.	4.213	9	NW.
Mar.	29.385	29.357	29.366	29.369	29.770	30	28.630	28	1.940	40.6	49.6	45.3	45.271.8	28	13.9	4	57.9	51.8	30.1	2.63	0.81	11.12	21	W.	11	E.	4.682	11	E.
Apr.	29.2	29.267	29.270	29.280	29.544	29	28.639	2	2.885	48.1	58.4	52.3	52.980.0	30	34.7	9	45.3	60.0	46.2	3.02	1.02	22	23	W.	15	W.	4.619	15	W.
May	29.348	29.305	29.323	29.325	29.671	20	28.944	19	1.683	58.8	70.6	62.9	64.185.0	22	43.6	29	41.4	71.7	57.3	5.56	1.43	4	23	NW.	2	N.	4.045	2	N.
June	29.408	29.360	29.379	29.382	29.645	16	28.992	10	1.633	69.4	80.8	73.6	74.693.1	22	58.8	11	34.3	82.1	67.9	2.77	0.69	9	10	SW.	9	E. SE.	3.078	9	E. SE.
July	29.311	29.274	29.289	29.291	29.542	21	29.001	81	1.451	71.1	82.9	75.5	75.601.0	24	62.7	21	28.3	83.6	69.8	1.73	0.61	28	20	W.	8	W.	3.396	8	W.
Aug.	29.440	29.382	29.406	29.409	29.639	9	29.052	29	1.587	68.8	82.8	74.2	75.191.5	17	59.8	9	32.2	83.6	67.5	2.05	0.87	21	18	SW.	8	NE. W.	3.165	8	NE. W.
Sept.	29.465	29.408	29.414	29.439	29.722	14	29.143	28	1.579	67.4	80.5	72.8	73.691.3	11	55.2	21	36.1	81.4	66.8	2.87	1.31	24	21	SW.	28	SW.	3.210	28	SW.
Oct.	29.543	29.491	29.512	29.515	29.840	15	29.226	8	1.614	65.4	68.5	59.9	61.387.7	3.5	31.0	24	56.7	69.8	54.0	1.35	0.55	27	20	SW.	21	SE. W.	3.300	21	SE. W.
Nov.	29.471	29.441	29.464	29.460	29.848	6	28.871	23	1.977	39.8	50.0	40.1	44.306.3	10	18.6	24	47.7	53.4	36.5	1.23	0.52	23	23	W.	23	W.	2.981	23	W.
Dec.	29.403	29.436	29.487	29.479	29.962	19	28.731	6	1.251	33.3	40.1	34.8	36.155.9	31	2.8	19	68.7	44.0	28.3	3.90	1.27	11.12	25	W.	6	E.	4.015	6	E.
Sums	353.122	352.621	352.874	352.871	352.871	30	28.659	19	9.857	612.9	740.7	691.3	671.7	9.22	578.5	764.7	594.0	39.28	46.810										
Means	29.427	29.385	29.406	29.406	29.406	29	28.659	19	8.821	51.1	61.7	55.1	56.093.1	9.22	9.7	15	48.2	63.7	46.8										

\* 30 days. † January. ‡ April. § June. || All wind movement should be increased 40 per cent before using. (See 10138, Sig. 1886.)

## CINCINNATI, OHIO—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—						Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—						River.																		
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.	Washington time.						Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°	Thunder-storms.	Highest.	Date.	Lowest.	Date.	Range.	Mean.										
								7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.															11 p. m.	Mean.								
1884.																																					
Jan.	8	7	9	10	10	26	11	13	2	18.0	21.0	81.7	75.9	80.1	79.2	5.8	9	7	11	11	14	18	2	24	0	0.38	11	1.15	5	13	23	6	24	5.5			
Feb.	11	6	7	13	11	13	8	14	4	33.1	36.7	84.9	34.9	80.8	78.6	6.3	7	4	8	11	14	18	2	10	0	0.38	11	1.15	5	13	23	6	24	5.5			
Mar.	8	12	16	14	10	4	13	15	1	24.2	34.3	78.3	59.0	70.3	69.2	7.3	7	6	8	11	14	17	4	9	0	0.49	8	17	17	11	7	81	9	36	9.0		
Apr.	9	10	15	7	8	8	21	12	5	40.0	39.2	43.6	74.5	73.3	66.7	7.8	4	5	8	14	14	17	4	9	0	0.43	8	17	17	8	22	14	0	24	6.4		
May	19	5	8	10	15	11	14	9	2	50.6	49.2	74.9	48.6	71.1	64.9	5.6	4	5	8	16	15	5	15	0	0	0	0	16	13	7	10	31	19	10	17	5.6	
June	7	12	15	15	8	4	1	13	63.4	62.5	63.9	62.9	73.4	69.1	5.2	6.3	4	5	10	16	5	8	11	0	0	0	0	16	13	7	10	31	19	10	17	5.6	
July	16	6	8	8	15	10	24	9	2	61.6	58.7	63.1	72.7	65.3	61.2	5.1	4	4	5	16	11	4	7	0	0	0	0	16	11	4	10	24	27	10	7	6	5.8
Aug.	12	15	7	10	8	13	16	7	6	59.2	55.6	73.8	49.7	62.4	58.8	2.9	4	4	5	16	11	4	7	0	0	0	0	16	11	4	10	24	27	10	7	6	5.8
Sept.	4	13	6	15	17	19	10	6	1	59.3	58.6	82.0	49.7	68.5	64.7	5.4	3	3	4	18	9	10	0	0	0	0	1	16	11	8	26	1	11	8	5.5		
Oct.	9	11	10	12	7	11	12	10	11	49.9	48.2	82.0	49.5	71.3	67.9	2.9	2	2	3	18	9	4	10	0	1	0	1	16	11	8	26	1	11	8	5.5		
Nov.	12	5	10	6	16	17	20	4	0	35.9	30.1	77.7	66.4	77.7	76.4	4.6	4	4	7	12	9	9	18	1	6	0	0	16	11	8	26	1	11	8	5.5		
Dec.	12	9	16	13	6	15	9	0	27.4	30.6	28.2	78.8	69.5	76.7	75.0	7.7	7	7	8	10	18	18	7	17	0	0	20	11	28	4	1	1	1	4	9	0	
Sums.	127	111	123	128	145	141	167	108	47	531.6	535.9	689.7	689.4	870.1	881.7	64.571	754.2	63.5	114	132	119	151	26	67	13	34	.....	.....	.....	.....	173	113	207	11	7		
Means.	11.6	10.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	44.3	44.7	73.3	57.1	72.5	69.3	5.4	6.0	4.5	5.3	31.2	28.6	252.6	41.87	118.3	619.3	71	94	14	2	6	126	14	6	17	4	0	

\* One 11 p. m. observation taken late.

† February.

‡ September.

NOTE.—7 a. m., 3 p. m., and 11 p. m.; Washington time, correspond to 6.30 a. m., 2.30 p. m., and 10.30 p. m., local time.

Correction for instrumental error of barometer used: From 6.30 a. m., January 1 to 10.30 p. m., December 31, 1884, inclusive, —.002 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.680; February, 0.680; March, 0.680; April, 0.670; May, 0.650; June, 0.630; July, 0.640; August, 0.640; September, 0.680; October, 0.680; November, 0.680; December, 0.700.

REMARKS.—January 5, Coldest day of year; February 14, greatest flood ever known, immense losses; April 8, last snow; May 30, last frost; October 24, first killing frost; November 8, first light frost; November 17, first snow; December 25 to 29, navigation stopped by floating ice in river.

L. DUNNE,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

CLEVELAND, OHIO.

Location of office on December 31, 1884, National Bank Building, corner of Superior and Water streets.

[Latitude, 41° 30' N., longitude, 81° 42' W. Elevation of barometer above sea-level, 690 feet. Elevation of exposed thermometer above ground, 73 feet. Elevation of rain-gauge above ground, 73 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.			Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	Washington time.			Monthly mean.			High est.	Date.	Low est.	Range.	Washington time.			Self-registering ther- mometers.			Mean maximum.	Mean minimum.	Any 3 con- secutive 8-hourly measure- ments.		Total amount.	Maximum hourly velocity during month.			Prevailing direction.	Total amount.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	7 p. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.					Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.			Total amount.	In.		In.	Miles.	Direction from—			Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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† September.

† February.

\* January.

**CLEVELAND, OHIO—Continued.**

Month.	Winds at 7 a. m., 8 and 11 p. m. Washington time: Number of times observed blowing from—						Dew-point.			Relative humidity (per cent.).			Cloudiness (in tenths).			Number of days—										
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.			Washington time.			Mean.			Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.
									7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.									
1884.																										
Jan.	12	5	5	4	22	18	5	0	12.0	14.9	0	13.9	81.9	70.8	81.0	73.9	6.9	2	15	14	18	29	0	0	0	
Feb.	11	19	2	11	7	15	11	0	24.3	25.2	26.4	25.8	87.5	81.1	83.7	84.8	7.9	0	14	15	24	7	24	0	0	
Mar.	10	18	6	8	13	10	13	0	25.6	27.1	27.2	26.6	82.3	71.8	77.3	77.1	7.2	0	15	12	9	20	0	2	0	
Apr.	11	24	4	13	1	8	10	18	1	32.3	33.0	31.4	32.9	75.1	70.1	68.8	4.5	4	11	12	8	0	0	1	0	
May	14	11	4	11	19	16	7	4	45.1	45.7	46.8	45.7	70.9	57.1	70.8	68.5	3.9	13	8	10	17	0	0	0	0	
June	11	23	18	20	8	2	1	4	57.4	57.4	57.2	57.8	75.2	67.1	71.8	69.2	3.7	17	12	1	4	0	0	0	0	
July	17	14	7	8	5	11	16	15	0	56.6	56.6	57.2	56.8	73.0	59.0	67.4	3.0	17	12	1	4	0	0	0	0	
Aug.	13	9	18	17	15	8	7	11	0	54.2	57.8	58.1	57.2	76.0	68.5	74.0	2.2	11	16	4	11	0	0	0	0	
Sept.	12	5	4	19	28	10	8	6	0	54.6	55.5	55.1	55.1	58.5	58.5	60.5	3.0	17	12	6	0	0	0	0	0	
Oct.	10	5	9	9	28	11	15	8	0	43.9	44.7	44.7	44.7	58.7	60.5	67.6	4.4	13	14	3	11	0	3	0	0	
Nov.	10	2	3	12	28	15	10	4	31.1	33.5	34.7	32.0	83.5	71.0	78.4	77.6	3.2	8	11	13	12	1	16	0	0	
Dec.	3	3	6	23	16	15	23	4	23.8	25.6	24.6	24.7	84.9	75.0	83.6	81.2	7.4	11	17	22	10	23	0	0	0	
Sums	134	138	81	155	180	135	159	112	4	462.9	477.4	475.4	471.9	789.6	899.3	876.9	63.6	103	154	109	158	45	121	0	22	0
	Percentages.																									
Means	12	212	6	7.4	14.1	16.4	12.3	4.5	10.2	0.4	38.6	39.8	39.3	78.5	65.8	74.9	73.1	5.3	28.1	42.1	29.8	45.2	12.8	33.1	0.6	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.41 a. m., 2.41 p. m., and 10.41 p. m., local time.

Correction for instrumental error of barometer used. From 6.31 a. m., January 1, to 10.41 p. m., December 31, 1884, inclusive,  $-.004$  inch. The barometric observations may be reduced to sea-level by adding the following corrections for the various months: January,  $0.780$ ; February,  $0.780$ ; April,  $0.760$ ; May,  $0.730$ ; June,  $0.730$ ; July,  $0.720$ ; August,  $0.720$ ; September,  $0.720$ ; October,  $0.740$ ; November,  $0.740$ ; December,  $0.790$ .

REMARKS.—Lake frozen January 3, 1884; lake frozen entire month of February. March, lake free from ice on 27th. First vessel of season arrived March 27. April, 1, 6, 10, 16, 20, 26, 30, 31; May, 5, 12, 19, 26, 31; June, 6, 13, 20, 27, 30; July, 4, 11, 18, 25, 31; August, and September, very pleasant last snow of season on 8th; last frost of season in city April 19. May 29 frost reported by person living out of town; June, July, August, and September, very pleasant months. September 19, earthquake at 2.47 p. m.; duration about five seconds; October 15, first light frost of season; first snow of season, October 23, and first killing frost, October 24; November about normal in all respects; December river frozen over on 1st; lake frozen 20th. Last vessel of season (Professor Schnoor, stone laden from the Labrador) arrived on 15th. Temperature about normal; precipitation below the average. Month cloudy and windy.

**WILLIAM LINE,**  
*Sergeant, Signal Corps, U. S. A.*

*Meteorological summary for the year ending December 31, 1884—Continued.*

COLUMBUS, OHIO.

Location of office on December 31, 1884, corner Broad and High streets.

[Latitude, 39° 59' N.; longitude, 82° 9' W. Elevation of barometer above sea-level, 305 feet. Elevation of exposed thermometer above ground, 53 feet. Elevation of rain-gauge above ground, 70 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.				Wind.						
Month.	Washington time.				Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.				Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 2-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.	Total movement.
	7 P. M.	9 P. M.	11 P. M.							7 P. M.	9 P. M.	11 P. M.	Monthly mean.	Maximum.	Date.	Minimum.	Date.				Absolute range.	Largest amount.	Date.	Miles.		
1884.																										
Jan.....	29.304	29.295	29.285	29.293	29.294	29.832	29.701	1	1.101	16.5	24.4	29.6	29.545	30	20.3	6	63.8	27.7	12.2	2.25	64	18	38	SW.	2	S.
Feb.....	29.172	29.144	29.156	29.156	29.157	29.658	29.510	19	1.146	32.1	39.7	34.5	34.562	5	19	0	29	43.5	44.0	4.95	44	6	38	SW.	20	SW.
Mar.....	29.165	29.140	29.148	29.151	29.153	29.693	29.593	25	.897	34.8	43.5	38.7	39.366	9	38	6	40	46.4	32.0	3.56	112	18	31	SW.	26	SW.
Apr.....	29.074	29.044	29.070	29.063	29.079	29.679	29.435	2	.954	43.0	49.0	44.0	44.077	0	30	0	47	58.2	40.5	2.11	106	1	34	SW.	15	W.
May.....	29.134	29.082	29.107	29.108	29.455	29.768	29.768	6	.697	55.9	68.0	59.6	61.285	5	23	39	70.9	52.5	2.79	116	4	32	W.	2	W.	
June.....	29.212	29.161	29.187	29.187	29.457	29.824	29.824	9	.683	67.4	80.0	70.7	72.792	0	22	55	82.6	63.2	2.99	97	24	25	SW.	8	N.E.	
July.....	29.089	29.051	29.070	29.070	29.328	29.838	29.838	31	.490	68.2	80.5	71.6	78.489	0	22	11	82.7	64.8	2.16	123	28	28	SW.	5	SW.	
Aug.....	29.228	29.167	29.194	29.196	29.423	29.833	29.833	29	.570	65.1	81.7	71.4	72.792	0	20	51	41	82.7	62.8	.70	55	28	29	SW.	3	SW.
Sept.....	29.263	29.195	29.235	29.231	29.554	29.950	29.950	28	.604	63.2	79.4	69.8	70.932	0	8	46	21	80.7	61.4	2.46	126	38	30	SW.	24	SW.
Oct.....	29.323	29.271	29.291	29.296	29.626	29.992	29.992	8	.644	52.3	65.1	56.8	58.187	0	8	28	82.4	58.2	1.66	68	27	28	SW.	8	W.	
Nov.....	29.241	29.201	29.230	29.234	29.504	29.873	29.873	6	.921	35.6	46.4	40.1	40.764	6	10	15	82.3	50.2	2.99	65	23	42	SW.	23	SW.	
Dec.....	29.203	29.227	29.254	29.248	29.742	29.992	29.992	19	1.240	29.3	35.3	31.1	31.959	6	5	7	67.5	40.3	2.77	78	6	43	W.	7	S.	
Sums.....	250.468	246.842	248.850	245.350	250.214	.....	.....	.....	9.907	564.4	698.8	616.4	636.5	.....	.....	.....	618.0	735.1	535.7	731.03	.....	.....	.....	.....	.....	61,727
Means.....	29.206	29.162	29.176	29.181	29.852	29.852	29.852	29	.826	47.0	56.2	51.4	52.202	.....	.....	.....	61.5	61.8	48.8	.....	.....	.....	.....	.....	.....	SW.

! Anemometer frozen March 8, from 2 to 7.45 a. m., about 40 miles lost.

\* Anemometer frozen—record incomplete.

\* January.

\* April.

\* Anemometer frozen December 13 and 21, about 56 miles lost.

\* June.

\* September.



## COLUMBUS, OHIO—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.								Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 50°.	Thunder-storms.	Anomalous.	
1884.																														
Jan.....	4	1	4	5	33	24	7	15	0	11.5	13.5	15.0	14.0	80.3	68.7	78.5	75.8	7.1	7.2	6.0	6.8	9	17	18	17	29	0	0	0	
Feb.....	7	9	7	16	11	19	8	10	0	27.5	30.7	30.4	28.5	79.5	70.6	78.0	76.0	6.7	7.8	6.9	6.8	3	15	11	2	13	0	0	0	
Mar.....	10	13	8	11	21	12	10	6	1	34.8	38.1	38.0	29.2	74.3	61.5	69.5	68.4	7.7	7.5	6.3	7.2	3	11	17	6	12	0	2	0	
Apr.....	12	13	8	10	7	18	20	6	1	24.8	38.8	39.0	37.5	73.1	57.0	69.3	66.5	6.7	6.8	5.7	6.2	6	10	14	5	2	0	3	0	
May.....	10	5	5	8	14	13	21	4	3	47.3	47.7	49.9	48.3	73.3	51.5	71.4	65.4	3.9	5.4	3.7	4.3	12	15	4	11	0	0	0	0	
June.....	13	17	11	12	16	7	4	7	7	59.3	59.3	60.5	59.7	75.6	51.5	70.9	66.0	3.8	5.7	4.5	4.7	10	18	7	9	0	0	0	0	
July.....	11	12	5	3	8	18	17	1	1	68.2	56.1	58.3	57.5	71.4	45.0	63.7	60.2	5.1	5.1	2.8	4.3	10	16	4	9	0	0	0	0	
Aug.....	16	10	3	7	11	19	17	0	0	56.6	55.6	58.0	56.7	74.5	42.6	63.4	60.2	3.8	2.4	2.4	3.7	14	13	4	0	0	0	0	0	
Sept.....	7	10	5	3	24	26	8	6	1	57.3	61.1	59.1	58.2	81.2	55.6	70.6	69.1	4.1	5.3	5.0	4.0	13	13	4	0	0	1	0	0	
Oct.....	9	9	2	9	14	14	19	16	1	47.2	49.0	48.1	46.1	83.1	59.0	73.6	71.9	3.6	5.0	2.2	3.6	78	13	5	1	0	0	0	0	
Nov.....	11	6	4	2	16	23	19	6	3	82.5	34.4	32.8	33.3	88.4	65.2	75.3	76.3	5.4	4.7	4.9	4.9	10	10	6	1	22	0	0	0	
Dec.....	13	3	10	14	23	7	15	8	0	26.0	28.2	26.2	24.8	87.5	76.5	82.1	82.0	8.1	7.6	6.6	7.4	4	10	17	7	1	0	0	0	
Sums ..	123	108	72	97	188	204	168	123	15	485.6	506.5	507.5	498.7	942.2	704.7	864.3	837.6	64.7	73.8	53.6	63.9	104	147	115	32	89	12	17	3	
Means ..	Percentages.																			Percentages.										
	11.2	9.8	6.6	6.6	11.8	13.6	13.2	1.4	40.5	42.2	42.3	41.7	78.5	53.7	73.2	69.6	5.4	6.2	4.4	5.8	23.4	40.2	31.4	33.8	3.7	24.3	3.8	4.6	0	

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.36 a. m., 2.36 p. m., and 10.36 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1 to 11 p. m., December 31, 1884, inclusive, —.005 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.900; February, 0.900; March, 0.890; April, 0.870; May, 0.840; June, 0.840; July, 0.830; August, 0.830; September, 0.840; October, 0.860; November, 0.860; December, 0.870.

REMARKS.—Date of last frost in spring, May 30, 1884; date of first frost in fall, October 13, 1884; date of first killing frost in fall, November 7, 1884. Summer months very dry. Earthquake at 2.42 p. m., local time, September 19, 1884.

F. T. WILLIAMS,  
Private, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

CONCHO, FORT, TEX.

Location of office on December 31, 1884, Post Quarters.

[Latitude, 31° 39' N.; longitude, 100° 24' W. Elevation of barometer above sea-level, 1,900 (B) feet. Elevation of exposed thermometer above ground, 6 feet. Elevation of rain-gauge above ground, 1 foot.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.					Precipitation.				Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
Month.	Washington time.					Self-registering thermometer.					Any 3 consecutive 8-hourly measurements.				Maximum hourly velocity during month.		Prevailing direction.	Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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	7 p. m.	3 p. m.	11 p. m.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Abnormal range.	Mean maximum.			Mean minimum.	Largest amount.	Date.	Miles.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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July.

March.

January.

## CONCHO, FORT, TEX.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).				Number of days—																
	North.		Northeast.		Southeast.		South.		Southwest.		West.		Northwest.		Number of calm.																		
																	Washington time.																
	7 a. m.	11 p. m.	7 a. m.	11 p. m.	7 a. m.	11 p. m.	7 a. m.	11 p. m.	7 a. m.	11 p. m.	7 a. m.	11 p. m.	7 a. m.	11 p. m.	7 a. m.	11 p. m.	7 a. m.	11 p. m.	7 a. m.	11 p. m.	7 a. m.	11 p. m.	7 a. m.	11 p. m.	7 a. m.	11 p. m.	7 a. m.	11 p. m.	7 a. m.	11 p. m.			
1884.																																	
Jan.....	9	12	1	5	21	17	8	12	25	38	3	35	3	12		23.4	29.0	23.9	28.4	83.3	55.3	80.5	73.7	4.5	13	10	8	7	2	23	0	0	0
Feb.....	9	17	4	8	18	13	14	6	3	35	3	39	3	4		36.0	37.3	36.4	38.0	78.5	53.0	72.4	66.0	4.5	13	14	11	6	1	7	0	0	0
Mar.....	1	16	10	5	10	5	11	9	10	43	0	41	5	45		43.4	41.5	45.7	43.4	79.6	38.2	65.5	61.1	2.4	13	14	11	6	1	7	0	0	0
Apr.....	5	21	9	4	16	5	11	9	3	56	1	58	2	56		56.7	56.1	58.2	56.7	80.4	48.5	79.5	72.5	2.8	13	14	11	6	1	7	0	0	0
May.....	7	15	16	11	19	11	6	5	5	63	8	63	8	60		60.4	60.4	60.4	60.4	80.4	43.0	74.7	67.9	2.8	13	14	11	6	1	7	0	0	0
June.....	2	7	23	22	18	5	8	5	2	65	1	65	1	62		62.0	62.0	62.0	62.0	80.4	43.0	74.7	67.9	2.8	13	14	11	6	1	7	0	0	0
July.....	1	6	12	16	50	4	0	0	3	62	4	53	5	59		59.1	59.1	59.1	59.1	80.4	43.0	74.7	67.9	2.8	13	14	11	6	1	7	0	0	0
Aug.....	0	15	17	16	34	5	0	0	10	64	5	62	6	64		64.5	64.5	64.5	64.5	83.9	53.9	76.3	73.0	2.4	13	14	11	6	1	7	0	0	0
Sept.....	1	18	7	13	27	2	2	0	9	53	4	56	5	55		55.0	55.0	55.0	55.0	83.9	53.9	76.3	73.0	2.4	13	14	11	6	1	7	0	0	0
Oct.....	6	18	4	16	29	4	5	5	9	53	4	56	5	55		55.0	55.0	55.0	55.0	83.9	53.9	76.3	73.0	2.4	13	14	11	6	1	7	0	0	0
Nov.....	8	18	4	16	29	4	5	5	9	53	4	56	5	55		55.0	55.0	55.0	55.0	83.9	53.9	76.3	73.0	2.4	13	14	11	6	1	7	0	0	0
Dec.....	9	22	9	4	6	19	12	7	5	30	5	32	7	33		32.7	32.7	33.1	32.7	87.6	56.5	80.9	73.0	5.0	13	14	11	6	1	7	0	0	0
Sums ..	58	164	110	118	313	104	84	63	79	580	4	582	5	582		582.5	582.5	582.5	582.5	795.2	545.2	844.8	795.2	45.2	109	135	62	77	7	52	107	45	0
Means .	5.3	14.0	10.6	10.7	23.5	9.5	7.7	5.6	7.2	43.4	0.4	43.5	0.4	43.5		43.5	43.5	43.5	43.5	79.5	54.5	80.9	73.0	4.1	2.7	3.8	1.9	1.9	1.9	1.9	1.9	1.9	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.27 a. m., 1.27 p. m., and 9.27 p. m., local time.

Correction for instrumental error of barometer used: From 5.27 a. m., January 1, to 9.27 p. m., December 31, 1884, both inclusive, +.003 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.029; February, 2.029; March, 1.970; April, 1.840; May, 1.900; June, 1.870; July, 1.880; August, 1.890; September, 1.900; October, 1.950; November, 2.010; December, 2.026.

V. M. KING  
First Lieut., Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1894—Continued.*

OUSTER, FORT, MONT.

Location of office on December 31, 1894, Post Quarters.

[Latitude, 45° 49' N.; longitude, 107° 34' W. Elevation of barometer above sea-level, 2,040 (B) feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain-gauge above ground, 21 feet.]

Month.	Barometer readings (corrected for temperature and instrumental errors only).										Temperature.										Precipitation.		Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	Washington time.					Washington time.					Self-registering thermometer.					Mean maximum.		Mean minimum.		Total amount.		Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	7 p. m.	3 p. m.	11 p. m.	Monthly mean.	Range.	Date.	Lowest.	Highest.	Date.	Lowest.	Highest.	Monthly mean.	11 p. m.	8 p. m.	7 a. m.	Date.	Minimum.	Absolute range.	Date.	Minimum.	Maximum.	Date.	Minimum.	Maximum.	Date.	Amount.	Largest amount.	Date.	Miles.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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• January.

† February.

‡ August.

§ December.

## CUSTER, FORT, MONT.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Washington time.										Relative humidity (per cent.).	Cloudiness (in tenths).	Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Dew-point.						On which .01 inch or more precipitation fell.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
										7 a. m.			11 p. m.			Mean.			7 a. m.			11 p. m.			Mean.			Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 33°.	Minimum below 33°.	Maximum above 80°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond to 4.58 a. m., 12.58 p. m., and 8.58 p. m. local time. Correction for instrumental error of barometer used: From 7 a. m. January 1, to 11 p. m., December 31, 1884, inclusive,  $+0.17$  inch. The barometer observations may be reduced to sea level by adding the following constants for the various months: January, 3.380; February, 3.380; March, 3.380; April, 3.180; May, 3.100; June, 3.060; July, 3.020; August, 3.000; September, 3.120; October, 3.240; November, 3.320; December, 3.460.

W. J. DAILEY  
*Corporal, Signal Corps, U. S. A.*



## DAVENPORT, IOWA—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew point.	Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								River.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	Washington time.									Mean.				Mean.				Mean.				On which .01 inch or more precipitation fell.				Maximum below 32°.				Minimum below 32°.				Thunder-storms.				Aurora.				Highest.				Date.				Lowest.				Date.				Range.				Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Thunder-storms.	Aurora.	High- est.	Date.	Lowest.	Date.	Range.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
1884.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Sums	Percentages.	Means.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
11	9	2	4	2	23	13	29	0	5.6	7.8	8.3	7.2	68.2	53.1	61.3	61.2	52.4	4.7	2.8	4.6	10	15	6	8	19	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

\* 8 days. † 17 days. NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.06 a. m., 2.06 p. m., and 10.06 p. m., local time. Correction for instrumental error of barometer used: From 6.06 a. m., January 1, to 10.06 p. m., December 31, 1884, inclusive, — .005 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, — .005 inch; 0.670; May 0.640; June 0.640; July 0.630; August, 0.630; September, 0.630; October, 0.600; November, 0.600; December, 0.710.

REMARKS.—March 24, navigation opened; first boat arrived; April 8, last snow of spring; May 20, last frost of spring; October 2, first frost of autumn; November 4, first snow of autumn; November 23, navigation closed last boat of season; December 18, river closed.

ROBT R. MARTIN, Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

DAVIS, FORT, TEX.

Location of office on December 31, 1884, Post Quarters.

[Latitude 30° 38' N.; longitude 106° 56' W. Elevation of barometer above sea-level, 4,928 (B) feet. Elevation of exposed thermometer above ground, 6 feet. Elevation of rain-gauge above ground, 10 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.				Wind.			
	Washington time.					Washington time.					Self-registering thermometers.						Any consecutive 8-hourly measurements.				Maximum hourly velocity during month.			
	7 p. m.	3 p. m.	11 p. m.	Monthly mean.	Range.	Date.	Lowest.	High.	Monthly mean.	Range.	Date.	Minimum.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Lowest amount.	Date.	Miles.	Direction.	Date.	Miles.	Direction.	Total movement.
1884.																								
Jan.	25.217	25.236	25.253	25.233	25.233	21.24.00	21.24.00	25.233	25.233	25.233	21.24.00	21.24.00	25.233	25.233	25.233	25.233	25.233	21.24.00	25.233	25.233	21.24.00	25.233	25.233	4,471
Feb.	25.205	25.128	25.150	25.156	25.156	22.24.00	22.24.00	25.156	25.156	25.156	22.24.00	22.24.00	25.156	25.156	25.156	25.156	25.156	22.24.00	25.156	25.156	22.24.00	25.156	25.156	5,888
Mar.	25.120	25.059	25.080	25.086	25.086	14.24.00	14.24.00	25.086	25.086	25.086	14.24.00	14.24.00	25.086	25.086	25.086	25.086	25.086	14.24.00	25.086	25.086	14.24.00	25.086	25.086	7,004
Apr.	25.166	25.106	25.111	25.128	25.128	21.24.00	21.24.00	25.128	25.128	25.128	21.24.00	21.24.00	25.128	25.128	25.128	25.128	25.128	21.24.00	25.128	25.128	21.24.00	25.128	25.128	5,851
May.	25.192	25.148	25.161	25.167	25.167	22.24.00	22.24.00	25.167	25.167	25.167	22.24.00	22.24.00	25.167	25.167	25.167	25.167	25.167	22.24.00	25.167	25.167	22.24.00	25.167	25.167	4,602
June.	25.228	25.184	25.205	25.211	25.211	22.24.00	22.24.00	25.211	25.211	25.211	22.24.00	22.24.00	25.211	25.211	25.211	25.211	25.211	22.24.00	25.211	25.211	22.24.00	25.211	25.211	4,353
July.	25.234	25.206	25.213	25.218	25.218	19.24.00	19.24.00	25.218	25.218	25.218	19.24.00	19.24.00	25.218	25.218	25.218	25.218	25.218	19.24.00	25.218	25.218	19.24.00	25.218	25.218	4,211
Aug.	25.205	25.237	25.243	25.250	25.250	20.24.00	20.24.00	25.250	25.250	25.250	20.24.00	20.24.00	25.250	25.250	25.250	25.250	25.250	20.24.00	25.250	25.250	20.24.00	25.250	25.250	3,794
Sept.	25.240	25.208	25.222	25.228	25.228	20.24.00	20.24.00	25.228	25.228	25.228	20.24.00	20.24.00	25.228	25.228	25.228	25.228	25.228	20.24.00	25.228	25.228	20.24.00	25.228	25.228	3,392
Oct.	25.251	25.242	25.259	25.261	25.261	16.24.00	16.24.00	25.261	25.261	25.261	16.24.00	16.24.00	25.261	25.261	25.261	25.261	25.261	16.24.00	25.261	25.261	16.24.00	25.261	25.261	4,512
Nov.	25.204	25.256	25.272	25.277	25.277	6.24.00	6.24.00	25.277	25.277	25.277	6.24.00	6.24.00	25.277	25.277	25.277	25.277	25.277	6.24.00	25.277	25.277	6.24.00	25.277	25.277	5,231
Dec.	25.222	25.142	25.166	25.177	25.177	12.24.00	12.24.00	25.177	25.177	25.177	12.24.00	12.24.00	25.177	25.177	25.177	25.177	25.177	12.24.00	25.177	25.177	12.24.00	25.177	25.177	6,085
Sum.	302.780	302.164	302.840	302.428	302.428	20.24.00	20.24.00	302.428	302.428	302.428	20.24.00	20.24.00	302.428	302.428	302.428	302.428	302.428	20.24.00	302.428	302.428	20.24.00	302.428	302.428	57,439
Means.	25.222	25.180	25.195	25.202	25.202	24.75.00	24.75.00	25.202	25.202	25.202	24.75.00	24.75.00	25.202	25.202	25.202	25.202	25.202	24.75.00	25.202	25.202	24.75.00	25.202	25.202	5,749

\* January.

† March.

‡ July.



## DAVIS FORT, TEX.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from--								Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days--																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	Number of calms.								7 a. m.		3 p. m.		11 p. m.		Mean.		7 a. m.		3 p. m.		11 p. m.		Mean.		Clear.		Fair.		Cloudy.		On whole, 0.1 inch or more precipitation fell.		Maximum below 33°.		Minimum below 33°.		Maximum above 30°.		Thunder-storms.		Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
	North.		Northeast.		East.		Southeast.		South.		Southwest.		West.		Northwest.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
1884.	21	4	0	16	20	18	1	0	21.0	23.5	25.3	23.8	75.8	39.9	60.2	58.6	3.5	14	13	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Jan.....	5	10	1	31	14	18	6	2	30.5	29.4	30.7	30.2	69.0	30.2	48.0	49.4	2.5	11	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Feb.....	5	4	0	6	6	63	2	1	35.6	32.7	32.0	33.4	77.2	30.5	45.7	51.1	4.0	11	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Mar.....	11	13	5	3	2	44	5	3	42.9	40.2	42.9	42.0	68.2	31.7	51.8	50.9	2.0	17	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Apr.....	6	13	3	15	1	36	3	0	54.5	51.6	54.9	53.7	75.4	38.3	61.2	57.6	2.7	10	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
May.....	7	13	3	15	4	5	37	2	60.7	52.8	55.9	56.8	75.4	27.5	48.2	50.4	3.0	15	14	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
June.....	8	6	17	7	12	25	2	0	54.5	54.6	54.6	54.6	73.7	39.2	53.9	56.0	2.7	18	14	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
July.....	13	9	11	6	4	20	1	1	54.0	54.1	50.1	55.6	80.8	43.0	67.9	65.0	3.0	10	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Aug.....	8	10	6	9	10	18	3	1	47.4	51.8	40.7	50.1	89.8	49.1	70.1	74.8	4.0	13	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
Sept.....	14	18	10	7	13	15	3	0	35.7	39.8	38.2	38.2	89.8	49.1	70.1	74.8	2.2	16	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Oct.....	19	5	1	0	11	32	3	0	31.6	29.3	31.0	30.6	87.8	39.7	60.2	63.6	4.2	15	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Nov.....	14	8	0	4	6	47	2	0	31.6	29.3	31.0	30.6	87.8	39.7	60.2	63.6	4.2	15	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Dec.....	14	8	0	4	6	47	2	0	31.6	29.3	31.0	30.6	87.8	39.7	60.2	63.6	4.2	15	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Sums ..	131	113	67	108	105	374	30	8	507.7	499.9	511.1	502.9	946.1	457.4	708.5	702.4	48.0	167	139	60	68	3	44	45	28	0	0	0	0	0	0	0	0	0	0	0	0	0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
Percentages.																		3	44	45	28	0	0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Means .																		12.010.3	6.1	9.8	9.5	9.4	1.2	2.7	244.8	43.3	49.8	42.6	41.9	78.8	38.1	58.6	58.5	2.1	5.2	3.2	2.8	0.8	12.0	12.310.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond to 5.12 a. m., 1.12 p. m., and 9.12 p. m. local time.

Correction for instrumental error of barometer used: From 5.12 a. m., January 1 to 5.12 p. m., December 30, inclusive, +.035 inch; from 1.12 p. m., December 30, to 9.12 p. m., December 31, 1884, inclusive, +.001 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 4.970; February, 4.860; March, 4.870; April, 4.760; May, 4.710; June, 4.600; July, 4.520; August, 4.640; September, 4.800; October, 4.840; November, 4.890; December, 4.930.

REMARKS.—Late killing frosts, April 21, 22; first killing frost, October 28. Officemoved March 8, from outside the post to Government building north side of post, inside reservation. Former elevation of barometer 4,940 feet; thermometer 4.6 feet; present elevation of barometer 4,928 feet; thermometer 5.5 feet; rain-gauge 10.3 feet.

I. H. ALBRECHT,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

Location of office on December 31, 1884, Fourth street, head of Spring street.

DAYTON, WASH.

[Latitude, 40° 19' N.; longitude, 117° 50' W. Elevation of barometer above sea-level, 1,673 (B.) feet. Elevation of exposed thermometer above ground, 6 feet. Elevation of rain-gauge above ground, 1 foot.]

Barometer readings (corrected for temperature and instrumental error only).															Temperature.						Precipitation.			Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
Washington time.					Monthly mean.					Washington time.					Self-registering thermometers.					Mean maximum.			Mean minimum.			Total amount.			Any 3 consecutive 8-hourly measurements.			Maximum hourly velocity during month.			Prevailing direction.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
7 p. m.		3 p. m.		11 p. m.		Date.		Lowest.		Date.		Range.		7 a. m.		3 p. m.		11 p. m.		Monthly mean.		Maximum.		Date.		Minimum.		Date.		Absolute range.		Mean maximum.		Total amount.			Any 3 consecutive 8-hourly measurements.			Maximum hourly velocity during month.			Prevailing direction.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.

§ December.

‡ August.

† February.

• January.

## DAYTON, WASH.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—												
	North.		Northeast.		East.		Southeast.		South.		Southwest.		West.		Northwest.		Number of calms.		Washington time.				Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.		Minimum below 32°.	Maximum above 80°.	Thunder-storms.	Auroras.	
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.													
1884.																																	
Jan.....	13	5	5	3	1	29	21	8	8	23.6	26.5	25.3	0	85.0	75.3	87.0	82.7	4.4	4.6	4.9	4.6	9	15	8	12	9	26	0	0	0	0	0	
Feb.....	8	11	4	6	8	38	13	7	3	15.9	19.0	18.2	18.0	83.6	64.0	85.3	77.6	5.5	5.7	5.3	5.7	14	10	13	16	14	24	0	0	0	1	0	
Mar.....	11	13	7	9	12	27	9	3	2	29.0	33.7	32.7	31.8	82.6	62.3	78.8	74.6	6.6	6.4	6.4	6.4	10	15	10	10	1	16	0	0	2	0	1	
Apr.....	8	13	19	5	5	26	13	0	1	35.0	38.5	35.5	37.3	77.8	47.8	67.0	64.2	3.9	4.2	3.3	3.8	15	16	10	14	0	0	0	0	2	0	1	
May.....	2	20	3	17	3	40	0	6	2	38.6	44.8	43.9	42.4	69.5	40.5	57.4	55.8	2.7	3.7	3.3	3.2	4	15	3	4	0	0	0	0	2	0	0	
June.....	7	5	7	12	10	26	9	2	2	46.9	49.8	49.2	49.2	77.1	44.8	64.1	62.0	5.8	5.5	5.4	5.6	16	16	8	16	0	0	0	0	2	0	0	
July.....	4	2	6	10	15	41	8	0	7	45.2	47.5	46.6	46.4	71.7	39.6	53.1	54.8	4.0	4.4	3.8	4.1	6	13	6	12	0	0	0	0	3	2	0	
Aug.....	6	5	11	13	7	39	8	4	0	43.2	43.6	43.3	43.0	59.8	28.4	39.1	41.8	1.6	1.5	1.3	1.5	2	15	1	3	0	0	0	0	2	0	0	
Sept.....	5	5	8	13	4	47	5	2	6	39.5	41.0	40.0	40.2	73.4	44.0	64.8	61.4	4.4	5.8	4.4	4.9	9	14	7	10	0	0	0	0	0	0	1	0
Oct.....	6	7	5	12	6	45	7	1	8	37.8	42.0	39.4	39.7	73.4	54.0	71.6	68.2	3.7	4.7	4.6	4.8	12	11	8	14	0	0	0	0	0	0	1	0
Nov.....	12	15	3	2	4	28	10	3	13	33.7	37.8	36.3	35.8	93.7	75.0	92.5	87.1	2.6	5.4	2.6	3.5	14	10	6	16	0	0	0	0	0	0	0	0
Dec.....	7	12	1	3	3	36	9	0	22	11.0	12.5	9.1	10.9	86.1	74.3	84.0	82.5	7.5	7.8	6.5	7.3	5	17	20	20	20	29	0	0	0	0	0	0
Suma ..	84	113	75	104	73	432	112	36	69	399.4	436.2	424.2	419.8	946.7	643.0	845.6	813.7	51.6	60.6	49.9	54.0	138	136	92	130	44	110	22	12	12	4	4	4
Percentages.															Percentages.							Percentages.											

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.16 a. m., 12.16 p. m., and 8.16 p. m. local time.

Correction for instrumental error of barometer used: from a. m., January to 11 p. m., December 31, 1884, inclusive, +.013 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.81; February, 1.82; March, 1.82; April, 1.76; May, 1.76; June, 1.75; July, 1.72; August, 1.72; September, 1.75; October, 1.79; November, 1.79; December, 1.84.

H. S. BLANDFORD  
Private, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1894—Continued.*

DEADWOOD, DAK.

Location of office on December 31, 1894, Big Horn Building.

[Latitude, 44° 28' N.; longitude, 108° 43' W. Elevation of barometer above sea-level, 4,600 (B) feet. Elevation of exposed thermometer above ground, 24 feet. Elevation of rain-gauge above ground, 53 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.			Wind.										
	Washington time.				Monthly mean.	Highest.	Lowest.	Date.	Range.	Self-registering thermometers.						Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Any secondary hourly measurements.	Maximum hourly velocity during month.			Prevailing direction.	Total movement.				
	7 p. m.	3 p. m.	11 p. m.	Monthly mean.						Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.							Mean minimum.	Total amount.	Largest amount.			Date.	Miles.	Direction from—	Date.
1884.	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>Miles.</i>		
Jan.	25.339	25.318	25.345	25.334	25.712	1	24.691	6	.721	18.2	25.7	19.9	21.3	59.1	12	14.5	4	73.6	31.0	11.5	.85	19	18	19	21	29	SW.	8,155		
Feb.	25.228	25.214	25.233	25.231	25.614	26	24.519	18	1.095	11.5	20.6	13.3	15.1	50.0	24	26.8	13	76.8	24.9	4.8	1.01	22	26	27	32	18	SW.	8,033		
Mar.	25.252	25.215	25.241	25.229	25.604	12	24.541	10	1.023	22.8	33.3	23.4	27.5	52.0	26	7.2	6	59.2	35.6	13.6	1.61	16	27	28	24	9	SE.	8,318		
Apr.	25.320	25.308	25.322	25.317	25.727	19	24.862	29	.865	20.7	41.5	34.1	36.1	62.0	24	13.0	6	49.0	43.9	23.6	2.20	43	7	8	19	29	SE.	8,603		
May	25.397	25.363	25.405	25.395	25.646	7	25.024	3	.622	42.9	54.5	48.0	49.1	71.5	10	23.0	1	43.5	59.5	40.7	1.72	39	27	28	31	27	NE.	3,833		
June	25.404	25.394	25.401	25.400	25.618	18	25.045	12	.578	56.6	71.2	62.4	63.4	91.0	26	43.0	1	48.0	73.7	54.8	2.51	.65	11	12	20	10	NE.	4,124		
July	25.426	25.404	25.426	25.417	25.610	8	25.192	31	.418	55.3	70.8	61.1	62.2	88.0	7	45.0	5	41.0	73.1	53.3	3.51	.70	26	27	21	2	NE.	3,643		
Aug.	25.409	25.451	25.466	25.462	25.680	3	25.216	1	.464	54.2	70.1	60.0	61.4	83.0	14	40.5	20	42.5	71.7	62.6	3.07	1.29	19	20	15	5	NE.	2,163		
Sept.	25.341	25.321	25.341	25.334	25.603	19	25.027	2	.636	48.7	60.9	50.9	52.8	78.5	13	28.0	30	50.5	63.1	44.7	1.99	.53	15	23	8	SW.	2,532			
Oct.	25.402	25.371	25.413	25.395	25.702	16	24.962	1	.800	44.0	57.2	47.4	49.4	76.0	14	24.0	30	50.0	60.1	39.5	1.49	.68	2.3	23	6	SW.	3,024			
Nov.	25.423	25.416	25.441	25.430	25.692	12	25.108	26	.554	31.2	43.2	33.8	34.1	62.0	6	4.0	23	54.0	46.6	27.8	1.46	.69	20	27	15	28	NE.	2,079		
Dec.	25.251	25.243	25.269	25.254	25.591	10	24.786	19	.806	7.5	16.8	11.1	11.5	53.0	1	23.0	24	31.0	31.0	3.5	1.79	.39	6	16	26	NE.	1,496			
Sum.	304.239	304.037	304.316	304.198	305.622	16	24.519	118	8.576	431.7	596.7	470.4	488.1	631.1	631.1	631.1	631.1	631.1	631.1	631.1	631.1	631.1	631.1	631.1	631.1	631.1	SW.	38,847		
Means	25.353	25.336	25.360	25.350	25.762	16	24.519	118	.715	35.1	47.2	34.2	35.0	63.4	136	35.0	34.5	61.8	61.8	61.8	61.8	61.8	61.8	61.8	61.8	61.8	SW.	38,847		

December.

June.

February.

October.

## DEADWOOD, DAK.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—							Number of calm.		Washington time.								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).				Number of days—					
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calm.	7 a. m.	8 p. m.	11 p. m.	Mean.			7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which more precipitation fell.	Maximum below 33°.	Minimum below 33°.	Maximum above 30°.	Thunder-storms.	Aurora.			
													7 a. m.	8 p. m.	11 p. m.																
1884.																															
Jan.....	11	6	21	0	0	1	4	9	17	12.9	16.3	14.0	0	14.4	0	83.1	68.1	75.2	75.5	4.1	11	14	6	15	20	0	0	0			
Feb.....	6	21	0	0	1	4	9	18	6	12.9	12.4	20.8	8.3	20.8	0	80.8	71.1	80.7	77.4	3.9	9	14	6	17	26	0	0	0			
Mar.....	2	20	26	10	10	10	14	15	18	12.9	23.9	20.8	20.8	20.8	0	81.8	68.5	76.9	77.0	5.2	10	10	11	16	26	0	0	0			
Apr.....	10	14	10	20	17	10	9	10	23	12.4	30.8	24.0	24.0	24.0	0	82.5	67.3	78.5	75.6	5.2	6	14	10	16	1	18	0	0			
May.....	8	25	6	13	10	17	9	5	38	39.3	39.3	38.9	38.9	38.9	0	78.5	54.5	70.8	68.4	2.7	17	8	6	11	0	3	0	0			
June.....	10	21	2	12	21	18	8	3	49	51.1	51.1	52.4	51.1	52.4	0	78.5	51.9	71.8	67.0	2.7	15	13	3	14	0	0	0	0			
July.....	11	26	9	6	14	15	5	0	49	50.9	52.5	51.4	50.9	52.5	0	79.5	53.0	76.1	68.5	3.9	12	16	3	0	0	0	0	0			
Aug.....	3	43	9	6	14	18	8	2	43	46.5	48.5	48.1	46.5	48.5	0	76.1	48.0	68.7	64.6	2.3	13	16	4	0	0	0	0	0			
Sept.....	1	26	9	6	14	18	8	2	43	37.8	38.6	39.5	37.8	39.5	0	72.5	47.8	60.4	62.2	2.5	15	10	3	0	0	0	0	0			
Oct.....	5	18	4	2	13	21	11	2	31	31.1	32.7	31.6	31.1	32.7	0	62.5	42.0	57.4	54.0	2.0	16	13	2	1	1	1	1	1			
Nov.....	2	17	5	4	8	37	6	3	21	23.6	23.6	21.4	23.6	21.4	0	66.0	48.0	60.8	58.3	2.0	17	9	4	3	25	0	0	0			
Dec.....	8	27	10	4	2	26	7	1	21	4.4	5.9	4.4	4.4	4.4	0	78.9	64.4	75.2	72.5	4.8	10	13	4	20	17	0	0	0			
Sums...	69	250	98	85	132	290	84	83	68	336.4	375.6	390.8	357.4	920.0	688.5	855.1	821.3	43.9	59.3	41.8	48.4	154	145	67	153	63	153	1	14	1	
Means...	Percentages.																														
6.9	25.0	8.9	7.7	12.0	23.7	7.7	2.9	8.0	28.0	31.3	30.1	29.8	76.7	57.4	71.3	78.5	8.7	4.9	3.5	4.0	42.1	39.5	18.3	41.8	17.2	41.8	32.8	8.9	7.7		

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.13 a. m., 1.13 p. m., and 9.13 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, +.015.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 4.96; February, 4.92; March, 4.84; April, 4.69; May, 4.52; June, 4.44; July, 4.43; August, 4.44; September, 4.56; October, 4.68; November, 4.84; December, 4.90.

GEORGE KINGSBURY,  
Private, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

DELAWARE BREAKWATER, DEL.

Location of office on December 31, 1884, northwest end Delaware Breakwater.

[Latitude, 39° 49' N.; longitude, 75° 10' W. Elevation of barometer above sea-level, 20 feet. Elevation of exposed thermometer above ground, 12 feet. Elevation of rain-gauge above ground, 26 feet.]

Barometer readings (corrected for temperature and instrumental error only).														Temperature.						Precipitation.	Wind.								
Month.	Washington time.			Monthly mean.			Washington time.			Self-registering thermometers.			Any consecutive 8-hourly measurements.		Maximum hourly velocity during month.	Prevailing direction.	Total movement.												
	7 a. m.	3 p. m.	11 p. m.	In.	In.	In.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.				Date.	Δ absolute.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	Miles.				
Jan .....	30.157	30.109	30.126	30.131	30.859	27	29.123	9	1.629	28.9	32.4	31.1	81.1	63.0	2	9.0	7	44.0	37.5	25.1	4.19	1.02	8.9	52	SW.	13	NW.	14,214	
Feb .....	30.068	30.045	30.099	30.071	30.727	16	29.163	28	1.564	30.4	42.2	38.2	89.9	63.5	5	15.0	29	48.5	46.9	32.0	6.14	1.72	23	66	NW.	20	SE.	11,847	
Mar .....	30.086	29.979	30.031	30.015	30.471	16	29.483	26	.968	37.8	42.8	39.6	40.1	62.4	12	15.3	1	47.1	47.0	34.6	6.71	1.79	19	56	NW.	30	NW.	12,976	
Apr .....	29.822	29.829	29.873	29.861	30.217	12	29.134	2	1.083	44.9	50.5	46.2	47.2	70.0	16	35.0	6	33.0	53.0	42.1	1.82	.72	25	28	SW.	9	NW.	11,484	
May .....	29.962	29.928	29.956	29.949	30.331	3	29.612	11	.719	58.2	63.7	58.0	60.0	81.8	2	45.5	30	35.8	66.6	53.7	.88	.48	7	40	NW.	20	SW.	10,806	
June .....	30.067	30.042	30.046	30.052	30.452	15	29.697	26	.755	65.3	70.6	65.5	67.1	84.1	21	52.3	1	31.8	73.5	61.5	1.37	.52	11	12	NE.	26	NE.	11,541	
July .....	29.882	29.834	29.861	29.859	30.042	22	29.618	29	.424	69.4	76.7	70.6	72.2	88.3	24	60.5	17	37.8	78.8	64.9	2.12	1.00	29	46	W.	24	SW.	10,542	
Aug .....	30.046	30.020	30.036	30.034	30.290	25	29.693	30	.597	70.7	76.2	70.8	72.6	91.9	20	65.6	13	39.3	75.4	62.1	4.19	2.48	4	53	SW.	23	NE.	9,192	
Sept .....	30.124	30.074	30.102	30.100	30.431	14	29.737	17	.694	67.8	75.5	69.0	70.6	88.4	9	55.2	23	33.2	75.4	64.9	.99	.80	30	12	SW.	14	SW.	10,697	
Oct .....	30.161	30.102	30.137	30.133	30.604	26	29.744	8	.860	57.9	63.9	59.4	61.1	83.8	6	34.5	16	46.8	67.9	54.7	1.12	.66	22	23	NE.	15	SW.	10,697	
Nov .....	30.104	30.054	30.073	30.077	30.446	22	29.384	28	1.062	44.4	52.6	46.9	48.0	99.4	2	28.0	25	41.4	54.8	41.5	2.42	.96	28	29	SE.	23	SW.	11,703	
Dec .....	30.177	30.125	30.153	30.152	30.618	20	29.585	6	1.033	37.5	41.9	39.0	39.5	60.6	15	8.9	20	61.9	45.4	34.0	3.22	.84	6	51	SW.	9	SW.	12,721	
Sum .....	30.096	30.040	30.062	30.060	30.424																								
Means .....	30.056	30.012	30.041	30.036	30.859	27	29.124	12	.931	51.8	57.7	52.9	54.1	91.9	120	3.9	20	38.3	60.7	48.4								SW.	139,490

\* January.

† April.

‡ August.

§ December.

## DELAWARE BREAKWATER, DEL.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—											
	Number of calms.								7 a. m.		3 p. m.		11 p. m.		Mean.		Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunder-storms.	Aurora.	
									North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.										
1884.																										
Jan.....	9	13	5	3	11	20	5	27	0	24.2	27.3	25.9	54.8	79.6	81.1	81.3	5.4	9	12	10	17	8	25	0	0	0
Feb.....	6	16	8	16	8	14	4	15	0	36.7	35.9	34.4	50.0	80.1	86.6	85.6	7.1	4	14	11	20	11	11	0	0	0
Mar.....	15	16	9	7	14	7	4	21	0	34.1	35.7	35.2	57.5	78.5	84.3	84.1	6.2	4	16	9	18	3	9	0	0	0
Apr.....	9	20	6	8	15	10	3	29	0	39.4	39.7	39.9	82.0	69.3	81.6	77.6	5.0	6	16	8	12	0	0	0	0	0
May.....	8	10	4	12	20	23	1	15	0	52.1	50.4	51.4	80.9	65.2	78.5	74.9	4.8	15	12	4	8	0	0	0	0	0
June.....	3	23	2	15	19	20	4	4	0	61.4	60.8	61.4	80.1	73.0	87.3	83.1	4.8	12	14	4	4	0	0	0	0	0
July.....	14	9	2	17	17	24	10	8	0	64.3	63.5	65.1	84.5	66.1	83.8	78.1	4.8	10	16	5	11	0	0	0	0	0
Aug.....	10	22	4	19	18	17	0	9	0	67.4	66.0	66.7	86.7	72.2	87.0	82.9	4.8	9	14	8	7	0	0	0	0	0
Sept.....	3	13	3	8	17	37	4	6	0	62.8	62.2	62.4	86.0	64.7	78.5	76.4	1.9	21	18	2	2	0	0	0	0	0
Oct.....	10	16	3	6	12	24	4	16	0	51.4	50.6	51.3	81.1	60.3	78.2	73.5	3.2	15	14	2	7	0	0	0	0	0
Nov.....	6	18	3	4	4	4	7	24	0	39.0	40.8	39.9	82.5	66.4	78.1	73.9	3.6	16	18	7	8	0	0	0	0	0
Dec.....	19	12	2	4	7	23	8	17	0	33.6	35.7	34.0	68.4	79.9	83.1	83.1	6.0	4	16	11	12	3	0	0	0	0
Sums ..	111	188	51	111	152	251	49	185	0	567.0	568.6	568.9	568.0	855.3	988.1	953.2	57.6	126	160	80	131	15	57	1	15	0
Percentages.																										
Means .	10.1	17.1	4.6	10.1	13.8	22.9	4.5	16.8	0	47.2	47.4	47.3	85.2	71.2	82.8	79.6	4.8	34.4	43.7	31.9	35.8	4.1	15.6	0.3	4.1	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.08 a. m., 3.08 p. m., and 11.08 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, + .004 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.020; February, 0.020; March, 0.020; April, 0.020; May, 0.020; June, 0.020; July, 0.020; August, 0.020; September, 0.020; October, 0.020; November, 0.020; December, 0.020.

CHAS. G. SHEARER.  
*Private, Signal Corps, U. S. A.*

*Meteorological summary for the year ending December 31, 1884—Continued.*

DENVER, COLO.

Location of office on December 31, 1884, Tabor Block, Sixteenth and Larimer streets.

[Latitude, 39° 45' N.; longitude, 105° W. Elevation of barometer above sea-level, 5,294 feet. Elevation of exposed thermometer above ground, 73 feet. Elevation of rain-gauge above ground, 86 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.				Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	Washington time.					Monthly mean.					Washington time.					Self-registering ther- mometers.					Any 8 con- secutive 8-hourly measure- ments.	Date.	Miles.	Direction from —	Maximum hourly velocity during month.	Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	7 a. m.		3 p. m.		11 p. m.		Date.	In.	Th.	In.	Th.	In.	Th.	Date.	Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.								Total amount.	Largest amount.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
	In.	Th.	In.	Th.	In.	Th.																								7 a. m.	3 p. m.	11 p. m.	Monthly mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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\* One 7 a. m. observation missed.

† October.

‡ February.

§ July.



## DENVER, COLO.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).					Number of days—													
	North.				South.				7 a. m.		8 p. m.		11 p. m.		Washington time.					Clear.	Rain.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunder-storms.	Aurora.			
	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	11 p. m.	Mean.													
1884.																															
Jan.....	9	6	3	10	22	6	11	6	10	12.7	15.1	18.1	15.3	62.3	40.7	60.3	54.4	2.8	18	11	3	5	4	28	0	0	0	0	0		
Feb.....	11	9	4	9	16	9	10	11	11	12.8	15.2	14.7	14.3	64.8	48.2	58.6	57.2	2.8	16	11	3	8	7	21	0	1	0	0	0		
Mar.....	15	9	1	7	10	5	10	17	18	23.1	18.5	24.0	22.1	68.3	39.3	59.5	55.6	4.0	13	15	3	7	23	0	0	0	0	0	0		
Apr.....	14	7	2	6	23	4	7	9	17	36.8	25.0	28.0	27.1	70.2	40.1	50.5	54.6	4.4	5	0	0	13	12	0	2	0	0	0	0	0	
May.....	14	8	7	5	28	7	6	18	2	36.4	35.1	40.2	37.2	71.2	41.5	50.9	57.5	5.2	9	19	9	17	0	0	0	0	0	0	0	0	
June.....	16	7	4	16	32	8	3	4	0	47.2	44.8	49.5	47.0	63.5	34.8	54.8	53.4	5.1	5	21	4	10	0	0	0	0	0	0	0	0	
July.....	8	6	4	12	39	15	3	15	0	48.9	45.1	50.3	47.3	61.3	23.2	45.6	43.4	4.4	8	21	3	12	0	0	0	0	0	0	0	0	
Aug.....	9	6	4	6	32	12	7	15	0	47.6	45.1	49.2	47.3	63.2	36.4	53.0	52.7	4.4	9	19	3	13	0	0	0	0	0	0	0	0	
Sept.....	11	7	11	8	33	8	4	9	2	37.9	33.5	39.7	37.7	58.6	25.5	41.5	41.2	2.4	18	13	4	3	0	0	0	0	0	0	0	0	
Oct.....	18	6	2	8	41	8	5	7	8	33.5	33.5	35.2	34.1	64.9	32.2	40.6	48.9	2.7	13	15	4	4	0	0	0	0	0	0	0	0	
Nov.....	21	5	2	7	35	7	7	8	0	20.0	21.5	21.4	21.0	60.1	31.6	48.1	48.0	2.3	20	9	1	13	14	22	0	0	0	0	0	0	
Dec.....	28	7	5	5	27	6	5	11	6	2.6	14.6	11.5	11.9	63.7	54.1	68.6	62.8	4.2	7	19	4	13	14	27	0	0	0	0	0	0	
Sums..	172	87	52	91	346	78	78	130	63	356.5	346.5	383.4	362.2	78.1	447.6	601.4	630.3	46.3	141	185	39	106	27	132	10	27	0	0	0	0	
Means.	Percentages.																	Percentages.													
	15.7	7.9	4.8	8.3	31.5	7.1	7.1	11.9	5.7	29.7	28.9	32.0	30.2	61.2	37.3	55.1	52.5	3.9	38.6	50.7	10.7	29.0	7.4	36.1	2.7	7.4	0	0	0	0	0

NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond to 5:58 a. m., 1:08 p. m., and 9:08 p. m., local time.

Correction for instrumental error of barometer used: From 3.08 a. m., January 1, to 3.08 p. m., December 31, 1884, inclusive, +.036 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 4.820; February, 5.520; March, 5.440; April, 5.270; May, 5.160; June, 5.040; July, 5.010; August, 5.020; September 5.110; October, 5.260; November, 5.500; December, 5.520.

J. GILLIGAN,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

DES MOINES, IOWA.

Location of office on December 31, 1884, 525 Walnut street.

[Latitude, 41° 25' N.; longitude, 93° 37' W. Elevation of barometer above sea-level, 849 feet. Elevation of exposed thermometer above ground, 35 feet. Elevation of rain-gauge above ground, 45 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.				Precipitation.		Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
Month.	Washington time.			Monthly mean.			Washington time.			Self-registering ther- mometers.			Any 3 con- secutive 8-hourly measure- ments.		Maximum hourly velocity during month.		Prevailing direction.	Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	7 P. M.	3 P. M.	11 P. M.	In.	Th.	F.	Date.	Lowest.	Highest.	Monthly mean.	7 P. M.	3 P. M.	11 P. M.	Maximum.	Date.	Abso- lute range.			Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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\* January.

† March.

‡ July.

## DES MOINES, IOWA—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).			Number of days—										
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Washington time.			Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Partly.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.	
									7 a. m.	3 p. m.	11 p. m.															
1884.																										
Jan.....	35	8	4	2	11	12	13	12	1	72.6	77.5	79.3	76.3	77.3	77.5	76.3	14	8	9	16	29	0	0	0	0	
Feb.....	32	8	6	7	10	15	8	10	1	72.2	77.3	79.3	76.3	77.3	77.5	76.3	6	13	14	16	29	0	0	0	0	
Mar.....	20	18	8	13	9	12	4	10	5	21.2	69.2	69.2	67.1	7.3	7.5	7.0	4	11	12	16	7	15	0	0	0	
Apr.....	23	10	6	16	8	10	6	10	6	26.8	70.9	70.9	68.1	6.8	6.7	6.8	9	16	16	16	0	0	0	0	0	
May.....	11	6	6	11	16	8	4	10	6	34.7	74.6	74.6	72.9	5.6	5.7	5.4	13	15	12	12	0	0	0	0	0	
June.....	21	7	5	23	20	11	3	10	9	44.7	83.7	83.7	80.9	5.4	5.7	5.4	13	15	12	12	0	0	0	0	0	
July.....	18	11	8	18	6	11	5	11	5	58.2	88.2	88.2	84.6	5.4	5.7	5.4	16	19	16	16	0	0	0	0	0	
Aug.....	11	2	8	18	6	11	5	10	13	57.1	84.4	84.4	81.5	5.4	5.7	5.4	14	10	7	10	0	0	0	0	0	
Sept.....	12	4	9	23	23	4	5	14	5	66.3	89.1	89.1	85.6	3.4	3.5	3.4	18	12	6	9	0	0	0	0	0	
Oct.....	10	8	4	2	19	24	5	14	7	43.8	84.5	84.5	81.0	3.4	3.5	3.4	18	12	6	9	0	0	0	0	0	
Nov.....	20	7	2	6	11	12	4	6	12	28.6	79.5	79.5	76.5	3.1	3.5	3.1	3	13	4	13	18	0	0	0	0	
Dec.....	24	16	0	0	9	9	6	10	2	9.6	75.3	75.3	72.7	6.5	7.3	6.9	3	12	16	14	28	0	0	0	0	
Sums ..	257	100	53	120	167	148	78	107	73	420.6	457.4	462.9	446.9	62.0	79.3	60.4	94	148	124	145	60	125	9	41	0	
Means ..	22.4	9.1	4.8	10.9	13.2	13.5	6.7	9.7	6.7	35.0	38.1	38.6	37.2	5.2	6.6	5.0	25.7	40.4	33.9	33.6	10.4	34.2	5.1	20.0	0	
Percentages.																	Percentages.									
* Mean, thirty days.																										

NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond to 5.54 a. m., 1.54 p. m., and 9.54 p. m. local time.  
 Correction for instrumental error of barometer used: From 5.54 a. m., January 1, to 9.54 p. m., December 31, 1884, inclusive, +0.12 inch.  
 The barometric observations may be reduced to sea level by adding the following constants for the various months: January, 0.970; February, 0.970; March, 0.960; April, 0.980; May, 0.980; June, 0.880; July, 0.880; August, 0.880; September, 0.880; October, 0.920; November, 0.960; December, 0.960.

F. W. CONRAD  
*Sergeant, Signal Corps, U. S. A.*

*Meteorological summary for the year ending December 31, 1884—Continued.*

**DETROIT, MICH.**

**Location of office on December 31, 1884, Chamber of Commerce building, corner Jefferson avenue and Griswold street.**

[Latitude, 42° 20' N.; longitude, 83° 3' W. Elevation of barometer above sea-level, 661 feet. Elevation of exposed thermometer above ground, 61 feet. Elevation of rain-gauge above ground, 71 feet.]

[illegible]

## DETROIT, MICH.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Relative humidity (per cent.).								Cloudiness (in tenths).				Number of days—					
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Washington time.				Mean.	7 a. m.	8 p. m.	11 p. m.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 50°.	Thunder-storms.	Auroras.	
										7 a. m.	3 p. m.	11 p. m.	Mean.														
1884.																											
Jan.....	9	4	1	2	14	26	20	13	7	11.9	17.0	13.2	72.6	73.3	72.9	7.1	8	15	18	17	29	0	0	0	0		
Feb.....	16	8	4	8	14	11	14	10	2	23.9	24.3	23.9	80.2	77.7	77.3	8.0	1	17	25	9	25	0	0	0	0		
Mar.....	20	11	10	8	11	15	8	9	1	26.5	29.1	27.0	78.9	77.2	72.5	6.1	5	16	15	8	18	0	0	0	0		
Apr.....	18	9	15	6	1	9	7	14	11	31.7	33.5	32.4	82.5	83.7	62.7	5.2	10	9	8	3	0	1	0	0	0		
May.....	5	8	7	12	16	9	3	42.8	40.0	45.1	84.6	81.3	61.3	61.3	61.3	4.6	11	5	8	0	0	0	0	0	0		
June.....	8	17	18	13	13	11	15	10	4	57.8	59.3	58.2	84.6	87.4	67.4	3.8	10	5	15	0	0	0	0	0	0		
July.....	12	11	4	5	11	15	18	16	1	64.6	57.9	57.7	84.6	87.4	67.4	3.8	13	5	13	0	0	0	0	0	0		
Aug.....	7	6	10	10	20	9	9	13	0	55.0	58.9	58.3	87.4	87.1	67.1	4.5	10	4	13	0	0	0	0	0	0		
Sept.....	15	7	6	9	40	0	8	6	0	55.2	57.6	58.0	86.9	83.3	72.0	3.2	13	3	13	0	0	0	0	0	0		
Oct.....	11	8	2	4	29	15	14	9	1	41.7	45.7	46.2	84.5	83.3	71.8	4.9	11	9	9	0	2	0	0	0	0		
Nov.....	3	5	2	7	15	24	14	20	0	37.9	32.5	31.7	80.9	75.1	71.2	5.7	10	6	14	3	14	0	0	0	0		
Dec.....	7	5	4	10	27	17	16	7	0	19.7	23.8	23.5	73.9	74.2	73.2	7.3	4	11	16	24	11	21	0	0	0		
Sums ..	118	98	83	94	216	174	149	136	30	447.7	459.6	475.2	873.7	882.2	824.5	61.4	111	147	108	177	48	112	0	20	1		
Percentages.																											
Means ..	10.7	8.9	7.6	8.6	19.6	15.8	13.2	12.4	2.7	37.3	40.8	39.6	72.8	71.0	68.7	5.1	5.3	30.3	40.2	23.5	48.4	13.1	30.6	0.5	5.0	3	

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.36 a. m., 2.36 p. m., and 10.36 p. m., local time.

Correction for instrumental error of barometer used: From 0.30 a. m., January 1, to 10.36 p. m., December 31, 1884, inclusive, +.017 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.766; February, 0.750; March, 0.750; April, 0.730; May, 0.700; June, 0.680; July, 0.680; August, 0.680; September, 0.680; October, 0.710; November, 0.740; December, 0.760.

REMARKS.—September 19, at 2.41 p. m., an earthquake was felt, lasting about five seconds; the duration of the shock, i. e., while the building quivered, was twenty seconds. No damage was reported in the city.

N. B. CONGER,  
Sergeant, Signal Corps, U. S. A.



## DODGE CITY, KANS.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent).		Number of days—													
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Washington time.			Cloudiness (in tenths).			Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.	Thunder-storms.	Aurora.		
										7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.										11 p. m.	Mean.
1884.																										
Jan.	10	4	2	12	8	12	23	22	1	10.9	13.7	14.5	13.0	73.3	47.0	70.2	63.5	1.8	3.9	1.6	0	0	0	0	0	
Feb.	15	7	5	17	4	17	23	21	0	16.1	19.3	19.7	18.4	73.8	57.3	74.2	69.9	4.1	5.5	5.5	0	0	0	0		
Mar.	14	13	9	26	7	11	17	11	0	24.8	27.4	28.3	28.2	72.8	43.7	60.4	58.9	3.4	5.2	4.0	0	0	0	0		
Apr.	12	3	11	16	9	2	13	24	0	31.9	30.0	33.7	31.9	71.6	38.5	60.4	58.3	4.5	4.7	4.0	0	0	0	0		
May.	14	2	15	24	8	2	13	14	0	45.7	46.2	48.5	46.8	70.5	48.5	72.6	68.3	6.3	6.0	4.0	0	0	0	0		
June	3	8	15	40	8	2	6	9	2	60.3	61.7	62.7	61.2	68.1	57.5	72.8	74.2	3.3	3.5	4.0	0	0	0	0		
July.	5	28	16	32	9	1	8	6	0	63.2	65.2	65.2	64.2	68.4	62.5	71.5	68.0	4.2	2.3	3.5	0	0	0	0		
Aug.	10	10	14	32	15	2	6	0	0	59.4	61.5	62.0	62.5	68.3	53.8	74.5	70.9	5.3	1.8	2.1	0	0	0	0		
Sept.	5	3	5	14	45	12	2	12	0	44.9	54.3	56.5	53.1	73.0	41.6	66.9	63.5	3.0	1.3	2.1	0	0	0	0		
Oct.	5	3	3	38	16	1	2	12	0	40.9	48.5	47.8	43.8	68.7	51.4	76.2	71.2	2.6	2.6	2.2	0	0	0	0		
Nov.	14	2	4	11	5	11	10	26	3	23.2	32.5	31.0	30.9	63.7	68.1	73.1	70.2	2.6	2.7	1.8	0	0	0	0		
Dec.	16	3	4	25	3	1	7	32	1	12.3	16.0	14.8	14.4	57.3	68.1	80.9	72.0	4.4	1.9	4.3	0	0	0	0		
Sums	114	86	101	318	106	54	109	202	8	453.6	473.8	432.7	470.1	963.8	609.7	800.5	811.4	40.8	52.0	40.2	23	31	0	0		
Means	Percentages.									Percentages.			Percentages.													
	10.4 7.8 9.2 29.0 9.7 4.9 9.1 16.4 0.7									37.8 39.5 40.2 39.2			25.4 12.3 36.3 3.0 3.4													

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time correspond to 5.28 a. m., 1.23 p. m., and 9.28 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.022 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.76; February, 2.74; March, 2.73; April, 2.64; May, 2.56; June, 2.51; July, 2.50; August, 2.48; September, 2.53; October, 2.63; November, 2.63; December, 2.60.

REMARKS.—Last killing frost, April 21; last light frost, May 2; first light frost, October 8; first killing frost, October 30.

J. E. L'ANOUETTE,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

DUNQUE, IOWA.

Location of office on December 31, 1884, corner Sixth and Main streets.

[Latitude, 42° 30' N.; longitude, 90° 44' W. Elevation of barometer above sea-level, 685 feet. Elevation of exposed thermometer above ground, 22 feet. Elevation of rain-gauge above ground, 45 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.		Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
	Washington time.					Monthly mean.					Washington time.					Self-registering thermometers.					Total amount.		Maximum hourly velocity during month.			Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
	Washington time.			Range.		Date.	Lowest.	Highest.	Date.	Washington time.			Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Direction.			From—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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• December.



**DUBUQUE, IOWA—Continued.**

Month.	Winds at 7 a.m., 3 and 11 p.m., Washington time: Num- ber of times observed blowing from—						Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—  Thunder-storms.								River.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	North.	North-east.	South-east.	South.	West.	North-west.	7 a.m.	3 p.m.	11 p.m.	Mean.	7 a.m.	3 p.m.	11 p.m.	Mean.	Clear.	Rain.	Cloudy.	On which oil inch or more precipitation fell.	Maximum below 32°.	Minimum above 50°.	Aurora.	Highest.	Date.	Lowest.	Date.	Range.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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Jan....	12	1	0	6	17	12	27	18	0	2.1	2.5	2.2	0	9	59.2	56.1	53.9	56.1	5.5	4.4	4.2	4.7	12	11	8	10	22	30	0	0	0	0	Ft. In.	Ft. In. Ft. In.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Feb....	6	15	5	7	12	6	14	21	1	8.0	15.1	12.8	12.0	67.0	62.0	63.4	64.8	7.0	7.8	6.4	7.1	2	14	13	18	17	27	0	0	0	0	Prosen.	1	4	12	2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
Mar....	16	12	6	11	9	10	11	16	2	18.0	23.1	21.8	21.0	63.8	57.8	63.6	64.1	7.3	6.9	5.9	6.7	5	13	13	16	9	17	0	1	1	1	12	9	26	11	5	27																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
Apr....	5	16	14	7	11	1	9	18	9	32.5	30.1	35.1	32.6	70.7	41.5	61.7	58.0	5.7	6.5	5.7	6.0	7	11	12	14	0	2	0	3	1	13	2	4.3	10	6	23	2	8	11	8.6																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
May....	15	5	7	8	18	13	12	11	4	43.5	41.5	46.8	43.9	69.9	44.2	85.5	59.9	5.1	4.9	5.3	5.1	10	11	10	16	0	0	0	3	0	11	6	16	9	2	31	2	4	10	6																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
June....	5	7	24	22	16	4	1	4	7	57.5	59.2	60.4	59.0	82.9	55.8	78.8	73.4	5.4	5.3	3.3	4.7	9	15	6	15	0	0	1	5	0	9	7	4.8	7	10	30	1	9	8	10.5																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
July....	5	4	14	12	4	9	24	17	57.4	56.6	60.2	58.1	80.5	50.5	74.3	68.4	5.4	4.7	3.0	4.4	10	15	6	15	0	0	1	10	0	7	8	1	4	3	22	3	5	5	7.9																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
Aug....	1	8	4	13	17	12	10	18	15	56.6	56.1	59.8	57.5	84.5	50.5	77.9	71.0	3.6	5.1	2.5	3.7	14	14	3	12	0	0	0	3	0	5	5	7	3	8	19	1	9	4	2	7																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
Sept....	2	3	4	14	31	3	9	5	55.1	57.9	58.2	57.1	80.9	56.0	74.3	70.4	4.3	5.2	4.4	4.6	10	14	6	13	0	0	1	5	0	14	6	24	25	8	10	1	2	10	8	5	8																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
Oct....	3	2	5	11	30	13	14	10	5	43.9	43.6	46.0	44.5	81.1	53.3	75.3	69.9	4.1	4.1	4.1	4.1	14	10	7	10	0	3	0	2	0	14	7	16	9	1	31	5	6	12	3	9																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
Nov....	4	6	4	13	7	8	25	15	24	6	27.2	27.4	26.4	77.0	68.2	74.2	68.2	4.2	3.9	3.4	3.8	5	11	8	18	3	17	0	0	0	8	9	1	2	8	3	30	5	4	7	3.5																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
Dec....	14	0	2	7	11	2	20	21	16	12.1	13.9	13.7	13.2	75.3	64.5	73.4	71.1	7.4	6.9	6.8	7.0	15	18	18	15	25	0	0	0	0	15	8	13	14	3	6	1	2	2	4	8																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
Sums	98	74	79	128	207	87	144	191	100	407.1	428.8	444.4	426.2	897.8	643.9	843.7	785.3	65.7	55.0	61.9	61.9	112	147	107	165	66	121	3	32	2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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7 days

†17 days.

NOTE—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6 05 a. m., 2 05 p. m., and 10 05 p. m., local time.

Correction for instrumental error of barometer used: From 0.05 a.m., January 1, to 10.05 p.m., December 31, 1884. Inclusive, +.000 inch.

0.750; May, 0.700; June, 0.690; July, 0.680; August, 0.680; September, 0.700; October, 0.720; November, 0.750; December, 0.770.

Correction for instrumental error of barometer used: from 0.05 to 0.1 m., January 1, to 0.05 p.m., December 31, 1905, inclusive, +0.00 mm.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.770; February, 0.760; March, 0.750; April, 0.740; May, 0.730; June, 0.720; July, 0.710; August, 0.700; September, 0.690; October, 0.680; November, 0.670; December, 0.660.

A. W. BROWNE, *Sergeant, Signal Corps, U. S. A.*

*Meteorological summary for the year ending December 31, 1884—Continued.*

DUNQUEN, IOWA.

Location of office on December 31, 1884, corner Sixth and Main streets.

[Latitude, 42° 30' N.; longitude, 90° 44' W. Elevation of barometer above sea-level, 685 feet. Elevation of exposed thermometer above ground, 82 feet. Elevation of rain-gauge above ground, 45 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).						Temperature.						Precipitation.			Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	Washington time.			Monthly mean.	Higheest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering ther- mometers.			Total amount.	Any 3 con- secutive 8-hourly measure- ments.	Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.			Minimum.			Date.	Abso- lute range.	Miles.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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§ January.

‡ September.

† March.

• December.

## DUBUQUE, IOWA—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time; Number of times observed blowing from—								Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								River.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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\*7 days.

†17 days.

NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond to 6:05 a. m., 2:05 p. m., and 10:05 p. m., local time. Correction for instrumental error of barometer used: From 6:05 a. m., January 1, to 10:05 p. m., December 31, 1884, inclusive, +.000 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.770; February, 0.760; March, 0.760; April, 0.750; May, 0.760; June, 0.680; July, 0.680; August, 0.680; September, 0.760; October, 0.760; November, 0.760; December, 0.770. A. W. BROWNE, Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

DULUTH, MINN.

Location of office on December 31, 1884, Metropolitan Block.

[Latitude, 46° 49' N.; longitude, 92° 0' W. Elevation of barometer above sea-level, 672 feet. Elevation of exposed thermometer above ground, 60 feet. Elevation of rain-gauge above ground, 56 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.			Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	Washington time.					Monthly mean.	Self-registering thermometers.					Total amount.	Any 8 consecutive hourly measurements.	Maximum hourly velocity during month.	Prevailing direction.	Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
	Washington time.			Range.	Self-registering thermometers.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	7 p. m.	3 p. m.	11 p. m.		Maximum.		Date.	Minimum.	Date.	Absolute range.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In

\* December.

† March.

‡ June.

## DULUTH, MINN.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m. Washington time: Number of times observed blowing from—								Dew-point.				Relative humidity (per- cent.).		Cloudiness (in tenths).				Number of days—										
	North	Northeast	East	Southeast	South	Southwest	West	Northwest	Washington time.				Mean.		7 a. m.		3 p. m.		11 p. m.		Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
									Number of calms.				Mean.		7 a. m.		3 p. m.		11 p. m.										
									7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.									
1884.																													
Jan.....	3	7	3	2	13	22	20	17	6	4.0	1.8	0.3	85.2	67.5	80.2	77.6	4.6	5.2	3.2	4.3	12	14	9	12	27	29	0	0	0
Feb.....	4	27	5	0	3	5	9	14	20	1.4	0.2	0.0	81.9	59.1	77.1	72.7	6.0	7.4	5.0	6.4	22	16	9	13	17	29	0	0	0
Mar.....	3	30	2	0	0	12	17	4	25	9.1	15.7	13.1	75.3	61.2	70.5	68.0	4.7	4.9	3.0	4.2	11	13	6	12	17	29	0	0	0
Apr.....	13	47	3	0	1	1	4	11	10	23.9	26.5	29.1	72.5	65.5	73.4	73.2	5.5	5.5	5.3	5.4	11	17	12	11	16	0	0	0	0
May.....	7	40	12	0	5	11	14	4	37.3	35.9	37.5	36.9	75.0	58.9	68.9	67.6	5.2	4.6	3.4	4.4	12	11	9	14	0	0	0	0	0
June.....	4	47	15	1	2	5	2	0	14	50.3	50.8	51.4	50.8	74.5	60.6	78.4	4.1	5.6	2.1	3.9	13	14	8	12	0	0	0	0	0
July.....	8	26	14	0	4	3	23	15	5	52.8	52.9	52.8	76.2	65.6	76.4	72.7	4.4	6.6	4.4	5.1	17	19	8	11	0	0	0	0	0
Aug.....	8	21	8	1	7	11	18	13	6	55.2	54.5	54.5	81.1	69.0	80.1	77.7	4.2	6.6	4.7	5.2	7	16	8	17	0	0	0	0	0
Sept.....	6	26	7	0	3	17	17	10	4	49.6	50.6	49.8	84.4	68.9	79.1	78.1	5.6	7.4	4.2	5.7	6	17	8	16	0	0	0	0	0
Oct.....	11	18	8	0	4	19	21	15	2	37.1	38.3	36.4	81.5	64.3	71.9	72.6	6.0	6.0	4.8	5.9	15	11	8	20	0	0	0	0	0
Nov.....	7	4	4	0	4	26	28	15	2	20.1	24.4	22.3	84.0	63.5	77.8	76.8	4.4	4.1	4.1	4.1	13	11	13	11	21	0	0	0	0
Dec.....	4	3	1	4	12	25	13	29	2	2.5	7.7	4.9	79.9	76.1	80.9	79.0	6.6	6.8	6.1	6.5	5	13	13	8	24	0	0	0	0
Sums ..	73	296	71	8	53	151	183	157	100	335.5	361.3	357.9	968.5	799.1	918.9	895.4	60.7	71.0	52.2	61.1	106	166	94	177	108	163	0	12	6
Means ..	6.6						7.0	0.7	4.8	3.6	7.4	8.1	28.0	68.6	76.6	74.6	5.1	5.9	4.4	5.1	26.0	45.4	26.7	48.4	29.5	44.5	0.3	31.6	
	Percentage.						Percentage.	Percentage.						Percentage.						Percentage.									
	6.6						7.0	0.7	4.8	3.6	7.4	8.1	28.0	68.6	76.6	74.6	5.1	5.9	4.4	5.1	26.0	45.4	26.7	48.4	29.5	44.5	0.3	31.6	

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6 a. m., 2 p. m., and 10 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.005 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.790; February, 0.790; March, 0.770; April, 0.750; May, 0.730; June, 0.710; July, 0.700; August, 0.700; September, 0.720; October, 0.740; November, 0.770; December, 0.800.

REMARKS.—Office moved December 1, 1884. Elevation of barometer lowered 13 feet; thermometer raised 3 feet. Authority, telegram and letter of November 3 and 4.

E. R. BRAUER,  
Private, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

EASTPORT, ME.

Location of office on December 31, 1884, United States Custom-House, northwest corner of Water and Washington streets.

(Latitude, 44° 54' N.; longitude, 66° 59' W. Elevation of barometer above sea-level, 61 feet. Elevation of exposed thermometer above ground, 23 feet. Elevation of rain gauge above ground, 53 feet.)

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.			Wind.			Total movement.						
	Washington time.					Self-registering thermometers.					Self-registering thermometers.						Any consecutive 8-hourly amount in inches.			Maximum hourly velocity during month.									
	Monthly mean.					Range.					Washington time.					Mean maximum.					Date.								
	7 a. m.	3 p. m.	11 p. m.	In.	In.	Lowest.	Date.	In.	In.	In.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.	Mean minimum.	Total amount.	In.	In.	In.	Miles.	Direction.	Date.	Miles.	Direction.	Total amount.
1884.																													
Jan.	30.010	29.964	29.937	29.977	30.078	29.896	2	1.772	14.6	20.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6
Feb.	30.032	29.937	29.909	29.979	30.084	29.867	29	2.037	22.3	27.6	24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2
Mar.	29.881	29.841	29.872	29.865	30.033	29.829	29	1.004	24.7	31.7	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.1
Apr.	29.706	29.683	29.719	29.703	30.129	29.779	15	1.350	37.9	43.8	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0
May	29.818	29.803	29.838	29.830	30.271	29.828	11	1.043	44.8	51.3	43.5	43.5	43.5	43.5	43.5	43.5	43.5	43.5	43.5	43.5	43.5	43.5	43.5	43.5	43.5	43.5	43.5	43.5	43.5
June	29.980	29.923	29.935	29.946	30.417	29.899	24	1.816	53.4	61.2	52.7	52.7	52.7	52.7	52.7	52.7	52.7	52.7	52.7	52.7	52.7	52.7	52.7	52.7	52.7	52.7	52.7	52.7	52.7
July	29.721	29.692	29.719	29.710	30.036	29.676	14	1.711	57.6	61.4	54.9	54.9	54.9	54.9	54.9	54.9	54.9	54.9	54.9	54.9	54.9	54.9	54.9	54.9	54.9	54.9	54.9	54.9	54.9
Aug.	29.972	29.933	29.961	29.955	30.189	29.870	31	1.512	58.9	68.5	57.6	57.6	57.6	57.6	57.6	57.6	57.6	57.6	57.6	57.6	57.6	57.6	57.6	57.6	57.6	57.6	57.6	57.6	57.6
Sept.	29.967	29.916	29.951	29.945	30.203	29.855	16	1.808	54.4	61.7	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5
Oct.	29.983	29.917	29.954	29.951	30.499	29.870	17	1.070	43.6	48.5	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
Nov.	29.886	29.866	29.864	29.870	30.434	29.804	29	1.340	34.6	38.0	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1
Dec.	30.001	29.978	29.971	29.983	30.712	29.827	7	1.505	34.2	28.2	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4
Sums	358.996	358.433	358.730	358.723	30.712	473.0	546.1	476.6	476.6	476.6	476.6	476.6	476.6	476.6	476.6	476.6	476.6	476.6	476.6	476.6	476.6	476.6	476.6	476.6	476.6	476.6	476.6	476.6	476.6
Means	29.916	29.871	29.894	29.894	30.712	29.867	20	1.165	30.4	45.5	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7

\* One 11 p. m. observation taken late.

† December.

‡ February.

§ August.

## EASTPORT, ME.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—							Dew-point.	Relative humidity (per cent.).	Cloudiness (in tenths).					Number of days—					Aurora.	Thunder-storms.					
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.			Washington time.					Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.			Minimum below 32°.	Maximum above 90°.			
										7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.										3 p. m.	11 p. m.	Mean.
1884.																										
Jan .....	17	6	5	2	9	21	9	17	10	17	12	11.0	75.0	70.6	78.9	74.8	6.2	8	7	16	17	18	20	0	1	
Feb .....	12	16	3	6	9	8	6	16	16	17	22	19.4	77.8	79.8	81.8	80.5	5.9	8	12	14	21	15	27	0	0	
Mar .....	14	11	8	3	11	9	5	20	16	18	23	21.4	79.8	72.2	75.8	76.3	7.4	5	10	16	15	22	0	0	0	
Apr .....	19	24	11	2	6	9	9	22	11	33	35	23.5	83.6	74.6	84.3	80.8	6.1	5	10	16	15	22	0	0	0	
May .....	9	9	7	4	19	5	9	22	38.5	38.1	38.8	38.8	79.8	67.2	84.2	77.1	6.0	6	12	12	21	0	5	1	2	
June .....	10	7	2	0	27	9	1	7	27	47.2	49.7	47.2	48.0	74.9	61.6	82.3	72.9	4.8	8	12	11	17	0	0	0	
July .....	9	6	1	4	33	7	7	11	15	52.8	54.7	51.8	53.1	84.8	73.2	80.6	83.2	3.5	9	7	18	0	0	0	0	
Aug .....	5	3	4	1	41	2	4	7	26	54.7	56.8	53.9	55.1	86.4	72.8	87.9	82.4	4.0	14	9	18	0	0	0	0	
Sept .....	4	6	4	2	24	13	10	16	49.0	49.7	49.1	49.3	82.1	66.9	85.6	78.2	3.1	5	12	5	12	0	0	0	0	
Oct .....	18	4	3	2	14	16	5	20	5	36.9	37.9	37.0	37.8	77.5	68.2	77.0	74.2	4.4	6	12	0	0	0	0	0	
Nov .....	7	2	4	0	13	16	13	23	9	28.6	30.4	29.8	29.6	78.5	72.8	78.1	76.5	5.9	14	10	11	0	18	0	0	
Dec .....	18	4	6	4	11	14	10	19	7	18.7	21.0	21.9	20.5	78.2	74.4	83.0	78.9	6.3	13	14	11	23	0	0	0	
Sums ..	142	98	58	30	218	123	88	190	403.4	432.5	416.2	417.4	936.4	854.3	938.5	934.8	67.8	91	146	128	178	55	120	16	25	
Means.	12.9	8.9	5.3	2.8	18.9	9.1	2.8	0.16	414.6	33.6	34.7	34.8	80.0	71.4	82.4	77.9	5.6	24.9	40.0	35.1	48.6	15.0	35.2	0.4	4.8	
	Percentages.												P. percentages.													

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.40 a. m., 3.40 p. m., and 11.40 p. m., local time.

Correction for instrumental error of barometer used: From 7.40 a. m., January 1, to 11.40 p. m., December 31, 1884, inclusive, + .005 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.070; February, 0.070; March, 0.070; April, 0.070; May, 0.070; June, 0.070; July, 0.069; August, 0.070; September, 0.070; October, 0.070; November, 0.070; December, 0.070.

REMARKS.—January, remarkably brilliant sunsets on 5th, 6th, 25th, and 26th, snow from cloudless sky in early a. m. of 21st; February, most severe storm for two years occurred on 28th; March, heaviest snowfall of season occurred on 8th; April, first light and heavy frosts of season occurred on 12th and 23d, respectively; May, frost observed on 28th; June, heaviest snowfall of season occurred on 30th; July, cold, foggy, disagreeable month; August, noted for unusual number of foggy days, there being eight days foggy against two for August, 1883; September, noted for absence of gales; October, first snow of season occurred on 14th, precipitation is 6.43 inches less than for October, 1883; November, rain-orm on 24th, 1.60 inches fell in four hours; December, an unusually large number of gales occurred remarkable for extremes of pressure and temperature.

D. C. MURPHY,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

ELLIOTT, FORT, TEX.

Location of office on December 31, 1884, soldiers' barracks.

[Latitude, 35° 30' N.; longitude, 100° 21' W. Elevation of barometer above sea level, 2,650 (B) feet. Elevation of exposed thermometer above ground, 7 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.				Wind.				Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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\* Rain gauge overflowed. † Two 7 a. m., two 3 p. m., and two 11 p. m. observations missed. ‡ January. § March. ¶ August. †† December.



## ELLIOTT, FORT, TEX.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.								Relative humidity (per cent.).	Cloudiness (in tenths).				Number of days—					
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Washington time.				Mean.	7 a. m.	3 p. m.	11 p. m.		Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunderstorms.	Aurora.
										7 a. m.	8 p. m.	11 p. m.	Mean.															
1894.																												
Jan.....	19	12	1	9	15	12	6	11	8	17.8	17.8	19.3	18.3	80.2	46.4	70.9	85.8	3.0	4.0	2.5	3.5	7	25	0	0	0		
Feb.....	10	19	2	12	15	9	2	12	6	22.6	21.8	23.2	22.5	83.8	47.6	71.5	87.6	4.3	4.5	3.5	4.1	1	24	0	0	0		
Mar.....	9	13	1	23	15	10	2	12	8	28.6	28.6	25.6	25.5	74.6	33.2	54.8	54.0	3.6	3.7	1.5	2.9	1	13	0	0	0		
Apr.....	26	4	5	15	12	7	2	11	8	32.5	29.5	32.9	31.6	70.1	30.1	56.4	82.2	5.5	3.8	2.4	3.9	2	0	0	0	0		
May.....	11	17	4	17	19	5	3	12	5	47.3	44.8	49.2	47.1	82.0	42.8	72.0	85.6	5.8	5.3	4.8	5.3	7	17	0	0	0		
June.....	5	4	3	19	23	2	0	10	8	60.3	63.6	62.9	62.3	94.9	56.5	77.2	73.5	3.3	3.8	3.1	3.6	0	0	0	0	0		
July.....	2	7	4	20	23	4	1	0	12	61.2	60.7	62.2	61.3	74.5	38.1	58.0	66.4	4.6	2.7	2.6	2.7	0	0	0	0	0		
Aug.....	2	13	11	24	23	10	5	5	5	59.7	60.7	57.6	56.4	81.1	39.2	64.6	81.0	2.6	2.6	4.4	2.2	0	0	0	0	0		
Sept.....	4	9	8	23	26	5	3	1	11	54.6	54.9	50.3	49.9	88.0	55.4	73.8	74.1	4.1	4.6	2.8	2.8	0	0	0	0	0		
Oct.....	12	1	0	18	34	3	2	6	17	43.6	50.9	50.3	49.9	88.0	55.4	73.8	74.1	4.1	4.6	2.8	2.8	0	0	0	0	0		
Nov.....	13	0	1	6	17	6	1	9	24	33.3	33.8	35.9	35.0	85.2	50.3	82.3	72.9	3.6	3.6	4.0	3.3	0	0	0	0	0		
Dec.....	23	0	0	8	18	1	9	5	17	17.9	20.4	19.0	19.1	85.6	66.7	81.8	78.0	4.6	4.6	9	7	13	28	0	0	0		
Sums ..	134	99	35	199	270	74	31	143	105	493.2	483.0	499.0	489.4	972.1	556.2	836.1	783.0	47.8	48.2	37.0	44.3	82	24	104	49	27		
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\* Two 7 a. m., two 3 p. m., two 11 p. m. observations missed.

1364 days.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.37 a. m., 1.37 p. m., and 9.37 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, inclusive  $\pm .001$  inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.830; April, 2.780; May, 2.700; June, 2.670; July, 2.640; August, 2.640; September, 2.690; October, 2.790; November, 2.830; December, 2.860.

J. O. RICKLI.  
Private, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

ELLIOTT, FORT, TEX.

Location of office on December 31, 1884, soldiers' barracks.

[Latitude, 35° 30' N.; longitude, 100° 21' W. Elevation of barometer above sea level, 2,650 (B) feet. Elevation of exposed thermometer above ground, 7 feet. Elevation of rain-gauge above ground, 1 foot.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.		Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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\* Rain gauge overflowed.

† Two 7 a. m., two 3 p. m., and two 11 p. m. observations missed.

‡ January.

§ March.

¶ August.

‡ December.

## ELLIOTT, FORT, TEX., CONTINUED.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—							Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
	Number of calms.							7 a. m.		3 p. m.		11 p. m.		Mean.		7 a. m.		3 p. m.		11 p. m.		Mean.		Clear.	Fair.	Cloudy.	On which precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunderstorms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.27 a. m., 1.27 p. m., and 9.27 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, inclusive  $\pm .001$  inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.830; April, 2.780; May, 2.700; June, 2.670; July, 2.640; August, 2.640; September, 2.690; October, 2.790; November, 2.830; December, 2.860.

J. O. RICKLI,  
Private, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

DODGE CITY, KANS.

Location of office on December 31, 1884, Hoover's Block.

[Latitude, 37° 45' N.; longitude, 100° 0' W. Elevation of barometer above sea-level, 2,517 feet. Elevation of exposed thermometer above ground, 16 feet. Elevation of rain-gauge above ground, 37 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.				Wind.				Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	Washington time.					Monthly mean.	Self-registering thermometers.					Washington time.					Total amount.	Any 2 consecutive 8-hourly measurements.	Maximum hourly velocity during month.		Prevailing direction.	Miles.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	7 p. m.	3 p. m.	11 p. m.	Date.	Range.		Lowest.	Date.	Highest.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Date.			Absolute range.	Mean maximum.			Mean minimum.	Largest amount.	Date.	Miles.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In

§ December.

† July.

‡ March.

\* January.

## DODGE CITY, KANS.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—																		
	Number of calms.								7 a. m.		3 p. m.		11 p. m.		Mean.		7 a. m.		3 p. m.		11 p. m.		Mean.		Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.	Thunder-storms.	Aurora.
									North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.									
1884.																																	
Jan.....	10	4	2	12	8	12	23	1	10.9	13.7	14.5	13.0	73.3	47.0	70.2	63.5	1.8	2.9	1.6	2.4	18	12	1	2	11	26	0	0	0	0	0	0	
Feb.....	15	7	5	17	4	7	11	0	16.1	19.3	19.7	18.4	78.3	57.3	74.2	69.9	4.1	6.7	5.5	6.4	8	13	8	9	11	27	0	0	0	0	0	0	
Mar.....	4	13	9	26	7	5	11	1	24.8	27.4	28.3	26.2	72.3	43.7	60.7	58.9	3.4	5.2	2.6	2.7	15	13	4	2	10	20	0	0	0	0	0	0	
Apr.....	12	3	11	16	9	2	13	0	31.9	30.6	34.3	31.9	71.6	36.7	60.4	54.2	4.5	5.7	4.0	4.7	10	10	6	9	9	10	0	0	0	0	0	0	
May.....	14	2	15	24	8	3	13	0	45.7	46.2	48.5	46.8	79.5	48.5	72.5	64.9	6.3	6.0	4.8	5.7	4	18	9	3	11	3	0	0	0	0	0	0	
June.....	3	8	15	40	8	4	6	9	60.3	61.7	62.7	61.6	85.1	57.7	79.8	74.2	3.6	3.5	4.0	3.4	13	14	3	0	0	0	0	0	0	0	0	0	
July.....	5	28	9	32	9	1	3	0	62.2	65.2	65.2	64.2	80.4	52.5	71.0	68.0	4.2	2.5	3.5	3.4	13	16	2	0	0	0	0	0	0	0	0	0	
Aug.....	10	10	14	32	15	3	6	0	59.4	61.0	62.0	60.8	84.8	53.5	74.5	70.9	3.8	4.3	3.3	4.8	12	13	6	0	0	0	0	0	0	0	0	0	
Sept.....	6	3	5	45	15	2	2	0	54.6	54.3	56.5	55.1	79.0	41.6	66.9	62.5	5.0	1.8	2.1	2.3	19	8	3	0	0	0	0	0	0	0	0	0	
Oct.....	5	3	7	38	16	3	8	0	46.2	46.5	47.8	46.8	85.9	51.4	76.2	71.2	3.6	3.6	2.3	2.1	18	7	6	0	0	0	0	0	0	0	0	0	
Nov.....	14	2	4	11	9	1	10	26	3	29.3	32.5	31.0	30.9	85.7	51.7	73.1	70.2	2.6	3.7	1.8	2.7	19	8	3	19	28	0	0	0	0	0	0	
Dec.....	16	8	5	25	3	1	7	32	1	12.3	16.0	14.8	14.4	87.9	68.1	80.9	79.0	4.4	6.1	4.8	5.1	11	11	9	15	13	0	0	0	0	0	0	
Sums ..	114	96	101	318	106	54	109	202	8	453.6	473.8	452.7	470.1	963.8	609.7	860.5	811.4	46.8	52.0	40.2	46.5	160	145	61	93	45	134	22	31	0	0	0	
Means ..	Percentages.																		Percentages.														
10.4	7.8	9.2	26.0	9.7	4.9	9.9	18.4	0.7	37.8	39.5	40.2	39.2	80.3	50.8	71.7	67.6	3.9	4.3	3.4	3.0	43.7	39.6	10.7	25.4	12.3	36.3	6.0	8.5	0	0	0	0	

NOTE.—7 a. m., 3 p. m., and 11 p. m.; Washington time correspond to 5.23 a. m., 1.28 p. m., and 9.28 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.022 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.76; February, 2.74; March, 2.73; April,

2.64; May, 2.55; June, 2.51; July, 2.50; August, 2.48; September, 2.53; October, 2.63; November, 2.74; December, 2.80.

REMARKS.—Last killing frost, April 21; last light frost, May 2; first light frost, October 8; first killing frost, October 30.

J. E. LANOUE,ETTE,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

DUNQUE, IOWA.

Location of office on December 31, 1884, corner Sixth and Main streets.

[Latitude, 42° 30' N.; longitude, 90° 44' W. Elevation of barometer above sea-level, 685 feet. Elevation of exposed thermometer above ground, 22 feet. Elevation of rain-gauge above ground, 41 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.							Precipitation.		Wind.				Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
	Washington time.					Monthly mean.					Washington time.			Self-registering thermometer.				Total amount.	Any 3 consecutive 8-hourly measurements.	Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	7 a. m.		11 p. m.		Monthly mean.	7 a. m.	3 p. m.	11 p. m.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	In.	3 p. m.	In.	11 p. m.												In.	3 p. m.			In.	11 p. m.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In

§ January.

† September.

‡ March.

\* December.

## 315

[illegible]

t17 daya

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.05 a. m., 2.05 p. m., and 10.05 p. m., local time. Correction for instrumental error of barometer used: From 6.05 a. m., January 1, to 10.05 p. m., December 31, 1904, inclusive, +.000 inch. The barometric observations may be reduced to sea-level by adding the following constants: January, 0.770; February, 0.750; March, 0.730; April, 0.710; May, 0.700; June, 0.690; July, 0.680; August, 0.690; September, 0.700; October, 0.720; November, 0.750; December, 0.770.

A. W. BROWN

*Meteorological summary for the year ending December 31, 1884—Continued.*

DUNQUER, IOWA.

Location of office on December 31, 1884, corner Sixth and Main streets.

[Latitude, 42° 30' N.; longitude, 90° 44' W. Elevation of barometer above sea-level, 665 feet. Elevation of exposed thermometer above ground, 22 feet. Elevation of rain-gauge above ground, 4½ feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).						Temperature.						Precipitation.			Wind.			Total movement.									
	Washington time.			Monthly mean.	Washington time.			Self-registering ther- mometers.			Total amount.	Any 3 con- secutive 8-hourly measur- ments.	Maximum hourly velocity during month.		Prevailing direction.													
	7 p. m.	3 p. m.	11 p. m.		Date.	Lowest.	Range.	7 p. m.	3 p. m.	11 p. m.			Monthly mean.	Maximum.		Minimum.	Date.	Absolute range.		Mean maximum.	Mean minimum.	Largest amount.	Date.	Direction from—	Miles.			
1884.	In.	In.	In.	In.	In.	In.	In.	o	o	o	o	o	o	o	o	o	o	In.	In.	1, 2	19	W.	30	W.	Miles 4,278			
Jan.....	29.451	29.420	29.444	29.438	29.801	29.817	13	1.084	9.4	18.5	14.3	14.1	44.0	13	23.8	5	67.8	23.0	4.5	.99	.44	1, 2	19	W.	30	W.	4,452	
Feb.....	29.330	29.294	29.309	29.311	29.767	29.744	19	1.023	17.3	26.5	22.8	22.2	41.7	1	7.5	15	49.2	31.0	12.4	2.19	.44	12	19	W.	21	N.W.	4,132	
Mar.....	29.299	29.280	29.305	29.295	29.716	29.449	11	1.267	28.9	37.5	32.8	32.2	65.2	27	3.8	4	69.0	40.5	23.7	3.85	1.02	25	28	E.	28	N.	4,905	
Apr.....	29.252	29.213	29.284	29.253	29.737	29.608	15	1.129	41.7	55.4	48.2	48.4	81.0	30	27.0	8	54.0	59.1	37.7	2.77	.95	1	28	S.W.	27	N.W.	4,098	
May.....	29.250	29.214	29.214	29.226	29.687	29.865	18	.832	53.5	67.4	59.2	60.8	91.0	22	38.7	29	42.3	71.0	49.8	4.88	1.48	1, 2	16	N.W.	13	S.	3,083	
June.....	29.835	29.301	29.301	29.312	29.579	29.009	8	.570	62.9	75.7	67.8	68.6	90.2	30	46.7	10	43.5	80.2	59.0	4.89	1.43	1, 2	20	N.W.	30	E.	2,973	
July.....	29.243	29.211	29.201	29.218	29.501	29.091	4	.510	63.5	77.5	69.0	70.0	91.7	22	51.5	6	40.2	82.0	59.8	5.30	2.15	13	26	N.E.	23	N.W.	3,278	
Aug.....	29.835	29.304	29.302	29.314	29.068	29.068	9	.283	69.6	77.6	67.1	68.4	90.0	19	48.9	8	41.1	70.6	58.4	4.25	1.63	17	18	W.	29	S.	3,760	
Sept.....	29.298	29.250	29.287	29.272	29.673	29.258	23	.915	61.1	75.8	66.9	67.9	92.5	8	47.1	20	45.4	78.2	58.8	4.07	1.44	23	26	S.	23	S.	3,773	
Oct.....	29.404	29.357	29.374	29.378	29.791	29.059	5	.732	49.5	62.0	53.9	55.1	87.0	8	27.7	28	57.3	64.4	47.1	4.16	1.69	7	20	W.	23	S.	2,839	
Nov.....	29.383	29.358	29.370	29.370	29.794	29.068	23	.968	31.0	42.5	35.4	36.3	64.6	9	1.2	24	65.8	46.8	27.4	1.43	1.00	22	23	N.W.	23	N.W.	3,071	
Dec.....	29.392	29.374	29.373	29.380	29.976	29.658	6	1.380	18.5	24.2	21.1	21.3	33.3	3	17.1	10	70.4	28.2	13.7	4.08	1.34	22	30	W.	31	N.W.	41,142	
Sums.....	351,971	351,676	351,694	351,747	29,978	29,490	7	639.4	557.5	564.5	47.1	92.5	18	616.0	95.5	0.451	842.86											S.
Means.....	29.331	29.298	29.308	29.312	29.978	29.490	11	.918	41.4	53.8	46.5	47.1	92.5	18	53.8	57.1	37.6											S.
																			September.			\$ January.						
																			March.			December.						

§ January.

† September.

‡ March.

• December.



## DUBUQUE, IOWA—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Num- ber of times observed blowing from—								Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days— Thunder-storms. Maximum above 800. Minimum below 320. On which oil inch or more precipitation fell.								River.																																																																																																																																																																																																																																																																																																																																																																																												
	North-east.		South-east.		South-west.		North-west.		7 a. m.		3 p. m.		11 p. m.		Mean.		7 a. m.		3 p. m.		11 p. m.		Mean.		Clear.		Rain.		Cloudy.		Maximum below 320.		Minimum below 320.		Maximum above 800.		Autumn.		Highest.	Date.	Lowest.	Date.	Range.	Mean.																																																																																																																																																																																																																																																																																																																																																																													
	North.	East.	South.	West.	North-west.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.							3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.

\*7 days.

†17 days.

NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time correspond to 6 05 a. m., 2 05 p. m., and 10 05 p. m., local time. Correction for instrumental error of barometer used: From 0 05 a. m., January 1, to 10 05 p. m., December 31, 1884, inclusive, + 0.00 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.770; February, 0.760; March, 0.750; April, 0.750; May, 0.740; June, 0.690; July, 0.680; August, 0.680; September, 0.700; October, 0.720; November, 0.750; December, 0.770. A. W. BROWNE, *Sergeant, Signal Corps, U. S. A.*

*Meteorological summary for the year ending December 31, 1884—Continued.*

DULUTH, MINN.

Location of office on December 31, 1884, Metropolitan Block.

[Latitude, 46° 49' N.; longitude, 92° 0' W. Elevation of barometer above sea-level, 672 feet. Elevation of exposed thermometer above ground, 60 feet. Elevation of rain-gauge above ground, 56 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.							Precipitation.			Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	Washington time.					Monthly mean.					Self-registering ther- mometers.							Any 8 con- secutive 8-hourly measure- ments.			Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	7 p. m.		11 p. m.		Range.	Date.		Lowest.	Highest.	Date.		Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	In.	3 p. m.	In.	11 p. m.		In.	5			In.	17														31.0	24	75.9	15.6	0	In.	17	25	36	NW.	2	SW.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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\* December.

† March.

‡ June.

## DULUTH, MINN.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.				Relative humidity (per-cent.).				Cloudiness (in tenths).				Number of days—					
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Washington time.				Washington time.				Clear.	Fair.	Cloudy.	On which more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.	
									7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.										7 a. m.
1884.																										
Jan.....	3	7	3	2	13	22	20	17	6	—	4.0	1.8	0	85.2	67.5	80.2	77.6	4.6	5.2	3.2	4.3	27	31	0		
Feb.....	4	27	5	0	3	5	9	14	20	1.4	0.2	0.3	0.3	81.9	59.1	77.1	72.7	6.0	7.4	5.9	6.4	27	29	0		
Mar.....	3	30	2	0	0	12	17	4	25	9.1	15.7	15.1	13.3	75.3	61.2	70.5	69.0	4.7	4.9	3.0	4.2	13	17	29		
Apr.....	13	47	3	0	1	1	4	11	10	26.9	26.5	29.1	27.5	78.8	65.5	73.4	73.2	5.5	5.5	5.3	5.4	11	7	0		
May.....	7	40	12	0	5	11	14	4	37.3	35.9	37.5	36.9	75.0	58.9	68.9	67.6	5.2	4.6	3.4	4.4	12	11	8			
June.....	4	47	15	1	2	5	2	0	14	50.3	50.8	51.4	50.8	80.2	74.5	80.6	78.4	4.1	5.6	2.1	3.9	13	14	3		
July.....	3	26	14	0	4	3	23	15	5	52.8	52.9	52.8	52.8	76.2	65.6	76.4	72.7	4.4	6.6	4.7	5.1	7	19	5		
Aug.....	8	21	8	1	7	11	18	13	6	55.2	56.5	56.3	56.0	81.1	69.0	80.1	77.7	4.2	6.6	4.7	5.2	7	16	8		
Sept.....	6	26	7	0	3	17	17	10	4	49.6	50.6	49.8	50.0	86.4	68.9	79.1	78.1	5.6	7.4	4.2	5.7	5	17	8		
Oct.....	11	18	3	0	4	3	19	21	15	37.1	38.3	36.4	37.3	81.5	64.3	71.9	72.6	6.0	6.0	5.8	5.9	11	16	0		
Nov.....	7	4	4	0	4	26	28	15	2	20.1	24.4	22.3	22.3	84.0	68.5	77.8	76.8	3.8	4.4	4.1	4.1	13	11	6		
Dec.....	4	3	1	4	12	25	13	29	2	2.5	7.7	4.9	5.0	79.9	76.1	80.9	79.0	6.6	6.8	6.1	6.5	5	13	18		
Sums ..	73	296	77	8	53	151	183	157	100	335.5	361.3	357.9	351.6	988.5	799.1	918.9	895.4	60.7	71.0	52.2	61.1	106	166	94		
	Percentages.									Percentages.									Percentages.							
Means ..	6.627 0 7 0 0 7 4.813 816.714 3 9.1									28.0 29.8 30.1 29.8 80.7 66.6 73.6 74.6 5.1 5.9 4.4 5.1									29.0 45.4 25.7 48.4 29.5 44.5 0.3 31.6							

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6 a. m., 2 p. m., and 10 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.005 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.790; February, 0.790; March, 0.770; April, 0.750; May, 0.730; June, 0.710; July, 0.700; August, 0.700; September, 0.720; October, 0.740; November, 0.770; December, 0.800.

REMARKS.—Office moved December 1, 1884. Elevation of barometer lowered 13 feet; thermometer raised 3 feet. Authority, telegram and letter of November 3 and 4.

E. R. BRACE,  
Private, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

EASTPORT, ME.

Location of office on December 31, 1884, United States Custom-House, northwest corner of Water and Washington streets.

[Latitude, 44° 54' N.; longitude, 66° 59' W. Elevation of barometer above sea-level, 61 feet. Elevation of exposed thermometer above ground, 23 feet. Elevation of rain gauge above ground, 58 feet.]

Barometer readings* (corrected for temperature and instrumental error only).										Temperature.					Precipitation.		Wind.			Total movement.
Washington time.					Self-registering thermometers.					Any 8 consecutive hourly amount in in.	Mean minimum.	Maximum hourly velocity during month.		Prevailing direction.						
7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.			Minimum.	Date.		Direction from—	Date.				
Month.					Highest.	Date.	Lowest.	Date.	In.	Th.	In.	Th.	Miles.	Direction from—	Date.	Direction.	Miles.			
1884.																				
Jan.....	30.016	29.944	29.937	29.977	30.678	28.906	29.906	2	1.772	14.6	20.6	17.6	17.6	17.6	17.6	17.6	9 46 S.W.	9,137		
Feb.....	30.032	29.937	29.969	29.979	30.684	28.647	29.647	28	2.037	22.8	27.6	24.2	24.2	24.2	24.2	24.2	28 { N.E. N.W.	7,858		
Mar.....	29.881	29.841	29.872	29.885	30.833	29.329	29.329	29	1.004	24.7	31.7	28.1	28.1	28.1	28.1	28.1	8 N.W.	8,306		
Apr.....	29.706	29.683	29.719	29.703	30.129	28.779	28.779	4	1.350	27.9	43.8	38.0	38.0	38.0	38.0	38.0	3 N.E.	6,263		
May.....	29.818	29.803	29.838	29.830	30.271	28.228	28.228	11	1.043	44.8	51.3	43.5	43.5	43.5	43.5	43.5	9 S.	5,522		
June.....	29.980	29.923	29.935	29.946	30.417	29.599	29.599	24	.818	63.4	61.2	52.7	52.7	52.7	52.7	52.7	2 N.	3,341		
July.....	29.721	29.692	29.719	29.711	30.036	28.335	28.335	14	.711	57.6	61.4	54.9	54.9	54.9	54.9	54.9	20 S.	4,101		
Aug.....	29.972	29.933	29.941	29.935	30.189	27.670	27.670	31	.512	88.9	68.5	57.6	57.6	57.6	57.6	57.6	20 S.	3,133		
Sept.....	29.967	29.916	29.931	29.945	30.303	27.245	27.245	19	.808	51.4	61.7	53.5	53.5	53.5	53.5	53.5	14 S.	4,239		
Oct.....	29.983	29.917	29.934	29.951	30.490	26.529	26.529	17	1.070	43.6	48.5	41.9	41.9	41.9	41.9	41.9	16 S.	7,569		
Nov.....	29.988	29.866	29.894	29.879	30.434	26.094	26.094	22	1.340	34.6	38.0	36.1	36.1	36.1	36.1	36.1	24 N.W.	7,232		
Dec.....	30.001	29.978	29.971	29.983	30.712	26.207	26.207	7	1.505	24.2	28.2	20.4	20.4	20.4	20.4	20.4	24 N.W.	8,219		
Sums	358,986	358,433	358,730	358,723					13,977	473.0	346.1	476.6	476.6	476.6	476.6	476.6	S.	75,000		
Means	29.916	29.871	29.891	29.894	30.712	26.647	26.647	20	1.165	39.4	45.5	39.7	39.7	39.7	39.7	39.7	S.	6,263		

\* One 11 p. m. observation taken late.

† December.

‡ February.

§ August.

## EASTPORT, ME.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—							Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Washington time.							Clear.	Rain.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunderstorms.	Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
1884.	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Sums	91	146	128	178	55	129	0	16	25																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
	17	12	16	3	5	3	9	8	7	17	10	10	18	78.9	79.8	81.8	74.8	6.5	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5.9	6.2	5

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.40 a. m., 3.40 p. m., and 11.40 p. m., local time. Correction for instrumental error of barometer used: From 7.40 a. m., January 1, to 11.40 p. m., December 31, 1884, inclusive, + .005 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.070; February, 0.070; March, 0.070; April, 0.070; May, 0.070; June, 0.070; July, 0.069; August, 0.070; September, 0.070; October, 0.070; November, 0.070; December, 0.070.

REMARKS.—January, remarkably brilliant sunsets on 5th, 6th, 25th, and 26th, snow from cloudless sky in early a. m. of 21st; February, most severe storm for two years occurred on 28th; March, heaviest snowfall of season occurred on 8th; April, first light and heavy frosts of season occurred on 12th and 23d, respectively; May, frost observed and ice formed one-eighth to one-fourth inch thick on the 30th; June, remarkable for absence of fog; July, cold, foggy, disagreeable month; August, noted for unusual number of foggy days, there being eight days foggy against two for August, 1883; September, noted for absence of gales; October, first snow of season occurred on 14th, precipitation is 6.43 inches less than for October, 1883; November, rain-storm on 24th, 1.60 inches fell in four hours; December, an unusually large number of gales occurred remarkable for extremes of pressure and temperature.

D. C. MURPHY,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

EASTPORT, ME.

Location of office on December 31, 1884, United States Custom-House, northwest corner of Water and Washington streets.

[Latitude, 44° 54' N.; longitude, 66° 59' W. Elevation of barometer above sea-level, 61 feet. Elevation of exposed thermometer above ground, 23 feet. Elevation of rain gauge above ground, 53 feet.]

Barometer readings* (corrected for temperature and instrumental error only).														Temperature.						Precipitation.			Wind.						
Month.	Washington time.				Monthly mean.	Washington time.				Self-registering thermometers.				Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly maximums in 1 month.	Maximum hourly velocity during month.		Prevailing direction.	Miles.	Total movement.							
	7 a. m.	9 a. m.	11 p. m.	In.		7 a. m.	9 a. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.					Maximum.	Direction from—				Miles.						
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.							
Jan.....	30.010	29.964	29.967	29.977	30.078	28	28.906	2	1.772	14.6	20.6	17.6	17.645	9	8.0	16	53.0	24.9	10.1	4.37	1.11	9	46	SE.	9	SW.	9	9,137	
Feb.....	30.032	29.937	29.969	29.979	30.084	16	28.647	29	2.037	22.3	27.6	24.2	24.745	0	14	4.5	50.0	31.9	17.1	9.38	3.17	23	24	55	NE.	28	NE.	28	7,858
Mar.....	29.881	29.841	29.872	29.885	30.033	11	29.329	29	1.004	24.7	31.7	28.1	28.248	0	23	6	5	48.6	34.2	21.9	3.74	1.02	27	41	NE.	8	NW.	8	8,306
Apr.....	29.704	29.683	29.719	29.703	30.120	15	28.779	4	1.350	37.9	43.8	38.0	39.957	0	24	28.0	3	29.0	45.0	24.6	0.83	2.27	16	50	NE.	3	NE.	3	6,263
May.....	29.818	29.803	29.838	29.830	30.271	31	29.228	11	1.033	44.8	51.3	43.5	40.572	0	28	34.2	20	38.6	51.6	30.6	0.79	2.05	8	9	NE.	9	NE.	9	5,522
June.....	29.980	29.973	29.935	29.946	30.417	14	29.599	24	.818	53.4	61.2	52.7	57.482	0	28	39.3	1	42.7	66.8	48.4	2.18	.63	20	21	NE.	2	NE.	2	8,341
July.....	29.721	29.692	29.719	29.710	30.036	4	29.335	14	.711	57.6	61.4	54.9	58.640	0	3	45.0	21	35.6	63.4	51.2	8.48	.40	9	30	SE.	20	SE.	20	4,191
Aug.....	29.972	29.933	29.961	29.955	30.189	13	29.676	31	.512	58.9	68.5	67.6	61.655	0	18	46.0	25	39.5	68.8	53.8	4.41	1.37	13	14	NW.	24	SE.	24	3,133
Sept.....	29.967	29.916	29.931	29.945	30.303	27	29.465	16	.808	54.4	61.7	53.5	56.582	0	5	37.6	14	45.2	63.9	50.0	1.89	.62	11	29	S.	16	S.	16	4,239
Oct.....	29.983	29.917	29.934	29.951	30.499	26	29.439	17	1.070	43.6	48.5	41.0	43.467	0	1	27.4	16	40.5	51.9	39.3	1.88	.54	25	34	NE.	31	NW.	31	7,569
Nov.....	29.888	29.866	29.884	29.879	30.434	29	29.094	26	1.340	34.6	38.0	36.1	36.454	0	24	10.0	19	38.0	43.1	30.1	5.97	1.79	4	5	NE.	24	NW.	24	7,282
Dec.....	30.001	29.978	29.971	29.983	30.712	27	29.207	7	1.503	24.2	28.2	26.4	26.351	0	7	21.0	20	72.3	33.5	19.5	8.03	3.04	21	22	SE.	15	NW.	15	8,219
Sums	358,996	358,433	358,730	358,723	30.712	127	28.647	220	13.977	473.0	346.1	476.6	478.5	...	...	...	...	523.5	582.6	415.6	94.53	...	...	...	...	...	...	...	75,000
Means	29.916	29.871	29.894	29.894	30.712	127	28.647	220	1.165	30.4	45.5	39.7	41.585	518	...	...	...	43.6	48.5	34.6	...	...	...	...	...	...	...	...	...

\* One 11 p. m. observation taken late.

† December.

‡ February.

§ August.



*Meteorological summary for the year ending December 31, 1884—Continued.*

ELLIOTT, FORT, TEX.

Location of office on December 31, 1884, soldiers' barracks.

[Latitude, 36° 30' N.; longitude, 100° 21' W. Elevation of barometer above sea-level, 2,650 (13) feet. Elevation of exposed thermometer above ground, 7 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	Washington time.					Monthly mean.					Self-registering thermometer.					Washington time.		Any consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
	7 p. m.		3 p. m.		11 p. m.	Range.		Date.	Lowest.		Date.	Highest.		Monthly mean.		Date.		Lowest.		Date.	Date.			Miles.	Direction from—	Direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	7 p. m.	3 p. m.	11 p. m.	7 p. m.	3 p. m.	11 p. m.	Range.	Date.	Lowest.	Date.	Highest.	Monthly mean.	7 p. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.						Mean maximum.	Mean minimum.	Total amount.	Latest amount.	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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\* Rain gauge overflowed. † Two 7 a. m., two 3 p. m., and two 11 p. m. observations missed. ‡ January. § March. || August. ¶ December.



## ELLIOTT, FORT, TEX.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	Number of calms.								7 a. m.				8 p. m.				11 p. m.				Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunderstorms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
									North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	8 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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\* Two 7 a. m., two 3 p. m., two 11 p. m. observations missed.

1364 days.

1366 days.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.37 a. m., 1.37 p. m., and 9.37 p. m. local time.  
Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, inclusive +.001 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.930; February, 2.930; March, 2.880; April, 2.780; May, 2.700; June, 2.670; July, 2.640; August, 2.640; September, 2.690; October, 2.790; November, 2.930; December, 2.990.

J. C. RICKLI  
Private, Signal Corps, U. S. A.



## EL PASO, TEX.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—						Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
	Number of calms.						Mean.		Mean.		Mean.		Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Anomalous.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	11 p. m.	7 a. m.	11 p. m.	7 a. m.										11 p. m.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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Jan.....	0	5	11	6	1	1	15	22.7	23.8	26.1	24.0	71.6	42.8	61.6	58.7	2.7	4.8	2.2	3.2	15	13	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.02 a. m., 1.02 p. m., and 9.02 p. m. local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.040 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 3.88; February, 3.88; March, 3.80; April, 3.74; May, 3.64; June, 3.59; July, 3.60; August, 3.60; September, 3.63; October, 3.74; November, 3.83; December, 3.86.

REMARKS.—Rio Grande River frozen January 1; snow fell on January 10, 16, and 17; last frost of the season, February 9; disastrous floods in the Rio Grande River during May and June; violent whirlwind on May 27, damaging buildings; first light frost of the season, October 28; first heavy frost of the season, November 19; sun-glows observed November 12 and 13; snow fell December 11; unusually bright red sunsets December 17 and 18; sleet fell December 29 and 30.

FREDERICK BELFORD,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

ERIE, PA.

Location of office on December 31, 1884, Fifth and State streets.

[Latitude, 42° 7' N.; longitude, 80° 5' W. Elevation of barometer above sea-level, 881 feet. Elevation of exposed thermometer above ground, 22 feet. Elevation of rain-gauge above ground, 52 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).							Temperature.							Precipitation.		Wind.		Total movement.									
	Washington time.				Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.			Mean maximum.	Mean minimum.		Total amount.	Any 3 consecutive 8 hourly measurements.	Maximum hourly velocity during month.	Prevailing direction.					
	7 P. M.	3 P. M.	11 P. M.	Month.						Maximum.	Date.	Minimum.	Absolute range.															
														Date.														
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.			
Jan.	29.373	29.329	29.359	29.334	30.015	27	28.674	2	1.241	18.3	23.8	20.5	0	0	0	0	0	0	0	0	0	0	0	0	0			
Feb.	29.296	29.281	29.285	29.287	29.883	13	28.514	19	.819	30.7	31.7	30.0	30.1	63.0	19	7	29	70.0	39.7	12.4	4.59	1.33	8.9	SW.	2			
Mar.	29.289	29.280	29.280	29.283	29.676	16	28.681	26	.966	30.8	35.8	33.6	33.2	64.3	23	1	1	965.8	31.8	25.9	3.84	1.07	4.5	82	W. S.	21		
Apr.	29.290	29.181	29.195	29.192	29.632	21	28.472	2	1.167	40.1	45.0	41.7	42.8	70.0	27	26.9	7	49.1	50.2	35.2	1.90	0.65	2	86	S.	15		
May.	29.217	29.198	29.212	29.209	29.555	8	28.851	19	.704	54.5	61.8	54.8	58.9	86.5	22	36.8	29	46.7	65.8	48.8	3.42	0.71	4.5	86	W.	2		
June.	29.264	29.332	29.334	29.321	29.721	15	28.971	9	.750	62.7	72.2	65.8	68.2	87.8	23	51.4	26	38.4	77.3	59.8	2.40	1.50	23	24	W. S.	25		
July.	29.179	29.164	29.167	29.170	29.857	21	28.871	31	.486	65.9	71.0	66.8	67.7	88.8	1	52.9	16	35.9	75.1	61.1	5.29	1.70	26	27	W.	6		
Aug.	29.327	29.307	29.300	29.312	29.597	9	28.903	29	.694	65.8	73.7	66.7	68.7	89.2	19	51.4	25	37.8	77.6	61.4	2.16	1.33	8.4	24	W.	30		
Sept.	29.304	29.323	29.342	29.343	29.755	14	29.976	26	.779	64.8	71.8	66.0	67.4	86.8	4	43.4	14	43.4	60.2	48.4	3.92	1.15	1.2	38	SW.	24		
Oct.	29.407	29.379	29.382	29.389	29.701	25	28.900	8	.811	52.8	59.8	55.6	55.6	79.9	4	31.4	26	48.5	63.4	48.4	3.23	0.95	1.2	38	SW.	23		
Nov.	29.311	29.281	29.298	29.297	29.670	3	28.656	23	1.014	38.5	44.4	39.4	40.8	64.7	10	15.8	24	48.9	47.8	33.6	4.91	0.90	23	24	W.	7		
Dec.	29.358	29.325	29.339	29.347	29.877	26	28.553	6	1.324	31.8	36.2	33.6	33.6	61.2	31	5.9	19	55.3	38.7	26.7	3.84	0.80	6.7	41	W.	7		
Sums	351.685	351.875	351.549	351.536	363.472	10,377	557.7	635.2	48.8	80.2	9	—10.0	508.8	681.5	495.3	45.47												
Means	29.307	29.281	29.298	29.295	30.015	27	28.472	12	.905	48.5	52.1	47.7	48.8	80.2	9	—10.0	25	46.9	54.8	41.3								

\* January.

† April.

‡ August.

§ Eighteen days only.

## ERIE, PA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point		Relative humidity (per cent.).		Clondiness (in tenths).				Number of days—								
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.				Washington time.				Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunderstorms.	Auroras.
									7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.									
1884.																									
Jan.....	5	12	1	4	16	37	10	9	14.4	17.9	16.1	16.1	84.6	79.9	82.6	82.4	8.7	9.0	7.9	8.5	18	29	0	0	0
Feb.....	8	19	3	2	15	8	24	7	25.1	26.3	25.6	25.7	85.8	80.4	83.5	83.2	8.6	9.1	8.1	8.6	5	24	0	1	0
Mar.....	8	24	2	4	14	9	17	8	25.4	27.5	26.9	26.6	81.9	72.5	76.7	77.0	5.8	7.7	6.3	6.6	4	17	0	0	0
Apr.....	3	23	4	4	10	23	10	9	33.4	33.2	34.4	33.7	77.7	65.4	76.0	73.0	6.4	5.8	4.2	5.5	1	10	0	0	0
May.....	4	11	3	5	21	16	22	8	33.4	46.0	45.6	45.4	71.2	59.4	72.2	67.6	5.9	5.5	3.8	5.1	0	5	0	1	0
June.....	10	26	7	8	18	5	9	6	44.7	56.8	57.7	57.3	72.6	60.7	75.7	69.4	2.9	3.2	2.4	2.9	0	0	0	3	0
July.....	7	10	2	1	11	13	27	22	57.4	57.6	57.1	57.4	74.9	63.7	73.4	70.7	4.9	4.3	3.8	4.3	0	0	0	2	0
Aug.....	12	8	6	4	24	14	16	9	57.1	59.3	57.3	57.9	73.9	61.5	72.4	69.3	3.3	2.7	2.3	2.8	0	0	0	5	0
Sept.....	8	5	4	8	24	17	10	14	56.2	57.7	56.2	56.7	75.5	62.7	72.0	70.1	3.9	5.2	2.9	4.0	0	0	0	1	0
Oct.....	7	12	4	5	21	10	13	15	45.3	47.9	47.5	46.9	76.2	67.0	77.9	73.7	6.0	5.9	5.0	5.7	0	1	0	1	0
Nov.....	3	4	3	2	20	28	13	17	33.2	36.7	33.5	34.5	81.4	75.1	79.4	78.6	7.1	7.9	6.6	7.2	0	12	0	0	0
Dec.....	5	7	1	3	31	19	14	8	25.9	27.4	26.9	26.7	78.6	70.3	79.2	76.0	8.4	7.7	8.6	8.2	9	22	0	0	0
Sums ..	80	161	40	55	219	192	198	130	475.5	494.3	484.8	484.9	834.3	817.9	821.0	801.0	71.9	74.0	62.2	69.4	36	110	0	15	2
Percentages.																									
Means	7.3	14.7	3.6	5.0	19.9	17.5	18.0	11.8	2.1	39.6	41.2	40.4	40.4	77.9	68.2	76.8	74.3	6.0	6.2	5.2	5.8	10.2	30.1	0.4	10.5

\* Eighteen days only.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.48 a. m., 2.48 p. m., and 10.48 p. m., local time. Corrections for instrumental error of barometer used: From 7 a. m., January 1, to 11 a. m., October 10, inclusive, +.009 inch; from 11 a. m., October 10, to 11 p. m., December 31, 1884, inclusive, +.007 inch.

The barometric observations may be reduced to sea-level by adding the following constants to the various months: January, 0.770; February, 0.770; March, 0.770; April, 0.750; May, 0.720; June, 0.720; July, 0.710; August, 0.710; September, 0.710; October, 0.730; November, 0.730; December, 0.770.

P. WOOD  
Private, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

ESCANABA, MICH.

Location of office on December 31, 1884, Adler's Building, corner Ludington and Donnan streets.

[Latitude, 45° 49' N.; longitude, 87° 5' W. Elevation of barometer above sea-level, 613 feet. Elevation of exposed thermometer above ground, 25 feet. Elevation of rain-gauge above ground, 38 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.			Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																														
	Washington time.					Monthly mean.	Washington time.					Self-registering thermometers.			Total amount.	Any 8 consecutive hourly measurements.	Maximum hourly velocity during month.	Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																			
	Washington time.			Range.	Date.		Lowest.	Date.	Highest.	Date.	Minimum.	Absolute range.	Mean maximum.	Mean minimum.																																																																																																																																																																																																																																																																																																																																																																																							
	7 p. m.	8 p. m.	11 p. m.																																																																																																																																																																																																																																																																																																																																																																																																		
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/i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub>&lt;/</i>

\*\* Two 7 a. m. observations missed.

\* December.

March.

June.

August.

February.

## ESCANABA, MICH.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	North. Northeast. Southeast. South. Southwest. West. Northwest. Number of calms.								7 a. m. 3 p. m. 11 p. m. Mean.				7 a. m. 3 p. m. 11 p. m. Mean.				Clear. Fair. Cloudy. On which .01 inch or more precipitation fell. Maximum below 32°. Minimum below 32°. Maximum above 90°. Thunder-storms. Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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\*\*Two 7 a. m. observations missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.20 a. m., 2.29 p. m., and 10.20 p. m., local time.

Correction for instrumental error of barometer used: From 6.20 a. m., January 1, to 10.20 p. m., December 31, 1884, inclusive, +.012 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.720; February, 0.720; March, 0.710; April, 0.690; May, 0.690; June, 0.650; July, 0.640; August, 0.640; September, 0.690; October, 0.670; November, 0.700; December, 0.720.

REMARKS.—On March 1, at 1.30 a. m., the elevation of the barometers were changed from 612 feet to 613 feet, by authority dated office of the Chief Signal Officer, February 14, 1884.

L. M. PINDELL,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

FORT SMITH, ARK.

Location of office on December 31, 1884, Government building, Garrison avenue.

[Latitude, 35° 22' N.; longitude, 94° 24' W. Elevation of barometer above sea-level, 451 feet.. Elevation of exposed thermometer above ground, 18 feet. Elevation of rain-gauge above ground, 20 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.				Wind.																																																																																																																																																																																																																																																																																																																																																																																																		
Washington time.				Monthly mean.			Highest.			Lowest.			Range.			Washington time.			Self-registering thermometers.			Mean maximum.		Mean minimum.		Total amount.		Any 8 consecutive hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.		Total movement.																																																																																																																																																																																																																																																																																																																																																																																				
7 p. m.	8 p. m.	11 p. m.		<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>	<i>J<sub>u</sub></i>

\* Two 7 a. m., two 8 p. m., and two 11 p. m. observations missed.

January.

February.

July.



FORT SMITH, ARK.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—								River.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	Number of calms.								7 a. m.		3 p. m.		11 p. m.		Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Minimum below 32°.	Maximum below 32°.	Maximum above 80°.	Thunder-storms.	Highest.	Data.	Lowest.	Date.	Range.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
									North.	Northeast.	East.	Southeast.	South.	Southwest.																West.	Northwest.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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† November.

† February.

\* Two 7 a. m., two 3 p. m., and two 11 p. m. observations missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.51 a. m., 1.51 p. m., and 9.51 p. m., local time.

Corrections for instrumental error of barometer used: From 7 a. m., January 1 to 3 p. m., May 12, inclusive, + .001 inch; from 7 p. m., May 13 to 11 p. m., December 31, 1884, inclusive, + .057 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.500; February, 0.500; March, 0.490; April, 0.490; May, 0.470; June, 0.460; July, 0.460; August, 0.460; September, 0.470; October, 0.480; November, 0.490; December, 0.500.

REMARKS.—Elevation changed from 449 to 451 feet; authorized by letter dated August 23, 1884. River was higher February 14 than it has been since 1877; river was above danger line on the 3d and 4th of May. Tornado passed near the station on the 27th of July.

ISAAC M. CLINE,

Private, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

GALVESTON, TEX.

Location of office on December 31, 1884, custom-house building, Mechanics street, between Twentieth and Twenty-first streets.

[Latitude, 29° 18' N.; longitude 94° 47' W. Elevation of barometer above sea-level, 40 feet. Elevation of exposed thermometer above ground, 37 feet. Elevation of rain-gauge above ground, 51 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.					Precipitation.			Wind.												
Month.	Washington time.			Monthly mean.	Highst.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Mean maximum.	Mean minimum.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.	Total movement.								
	7 a. m.	3 p. m.	11 p. m.						Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.			Total amount.	Date.	Direction from—	Miles.										
		<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Largest amount.	Date.	Direction from—	Miles.	Date.	Direction from—	Miles.				
1884.																														
Jan.	30.204	30.211	30.216	30.210	30.644	21	29.700	23	.884	43.5	48.9	47.6	46.7	70.5	30	22.0	8	48.5	56.9	40.0	5.13	1.69	16, 17	38	N.	1	N.	8,958		
Feb.	30.033	30.037	30.061	30.050	30.415	20	29.713	18	.702	58.0	63.7	59.6	60.4	75.0	22	28.5	15	46.5	66.5	54.6	.89	.24	13, 14	42	N.	27	N.	7,560		
Mar.	29.983	29.965	29.976	29.975	30.300	15	29.689	23	.611	61.4	68.4	64.6	64.8	77.3	28	41.2	1	36.1	70.4	59.6	4.84	2.96	17, 18	33	N.	17	SE.	8,214		
Apr.	29.800	29.822	29.831	29.828	30.224	23	29.589	14	.635	64.7	70.4	66.6	67.2	81.0	15	48.4	22	32.6	72.7	62.3	5.55	2.53	4, 5	37	N.	20	SE.	9,382		
May	29.940	29.929	29.935	29.940	30.150	9	29.703	1	.387	73.1	79.4	75.1	75.9	84.4	18	59.7	8	24.7	80.8	70.3	8.42	2.27	3, 4	38	NW.	17	S.	7,064		
June	29.941	29.935	29.939	29.935	30.096	28	29.801	5	.295	78.5	85.5	80.2	81.4	90.6	28	66.0	3	24.6	87.1	76.2	6.84	2.59	19, 20	18	S.	3	S.	3,858		
July	29.964	29.956	29.947	29.956	30.085	6	29.795	10	.290	82.2	89.2	84.1	85.2	94.8	9, 10	76.0	1	15.8	90.6	80.6	1.16	.70	1	22	SW.	13	S.	5,543		
Aug.	29.990	29.982	29.979	29.984	30.096	4	29.846	30	.250	80.3	87.8	83.3	83.8	93.0	30	70.6	6	22.4	89.1	78.8	1.77	.78	6	21	SE.	31	SE.	6,577		
Sept.	29.962	29.950	29.963	29.958	30.157	20	29.802	23	.355	80.9	86.4	83.1	83.5	90.5	12, 14	74.0	4	16.5	87.8	79.0	7.04	3.02	27, 28	27	SE.	27	SE.	6,419		
Oct.	30.053	30.030	30.058	30.047	30.276	24	29.880	26	.396	72.1	77.6	74.6	74.8	87.2	1	57.3	30	29.9	79.7	69.7	7.37	5.12	25, 26	27	N.	22	SE.	6,760		
Nov.	30.120	30.089	30.126	30.112	30.469	6	29.645	22	.817	59.2	64.6	61.8	61.9	75.0	1, 4	44.5	24	30.5	68.2	56.5	4.25	2.51	29, 30	37	NW.	22	E.	7,327		
Dec.	30.010	29.980	30.025	30.005	30.339	19	29.670	4	.669	55.7	59.6	57.5	57.6	72.5	21	29.3	18	43.2	65.0	50.5	9.44	1.50	28	36	N.	31	S.	9,183		
Sums.	360.150	359.992	360.157	360.100	360.644	21	29.589	14	6.291	809.6	881.5	838.1	843.2																	
Means	30.012	29.999	30.013	30.008	30.644	21	29.589	14	.524	67.5	73.5	69.8	70.3	94.8	19, 10	22.0	8	31.2	76.2	64.8										

• January.

† April.

‡ July.

## GALVESTON, TEX.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—																														
																	On which .01 inch or more precipitation fell.	Maximum below 33°.	Minimum below 33°.	Maximum above 30°.	Thunder-storms.	Aurora.																							
	Washington time.																																												
North.		Northeast.		East.		Southeast.		South.		Southwest.		West.		Northwest.		Number of calm.		Mean.		11 p. m.		7 a. m.		Mean.		Clear.		Cloudy.		On which .01 inch or more precipitation fell.	Maximum below 33°.	Minimum below 33°.	Maximum above 30°.	Thunder-storms.	Aurora.										
7 a. m.		3 p. m.		11 p. m.		Mean.		7 a. m.		3 p. m.		11 p. m.		Mean.		7 a. m.		3 p. m.		11 p. m.		Mean.		8 p. m.		11 p. m.		Mean.																	
1864.																																													
Jan.	31	13	7	16	12	3	4	7	32.0	40.6	43.4	40.3	79.6	74.3	81.2	78.4	5.9	5.2	4.6	5.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
Feb.	16	3	5	11	37	2	2	4	53.9	53.5	53.9	53.7	94.5	72.1	80.3	79.0	5.0	6.3	2.9	4.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
Mar.	13	10	6	23	23	9	3	4	56.3	54.5	58.7	57.2	84.5	68.8	82.1	78.4	6.3	6.4	3.0	5.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
Apr.	10	5	10	25	19	8	3	10	56.0	60.1	60.2	58.8	84.6	71.6	80.8	78.4	5.7	6.6	4.0	5.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
May	7	4	14	19	38	6	2	3	67.8	67.5	63.9	68.1	84.0	63.6	81.8	78.1	5.7	6.2	4.3	5.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
June	6	3	11	23	28	8	6	2	72.4	71.2	72.0	71.9	82.1	63.3	75.5	73.7	4.5	4.0	2.4	3.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
July	1	0	1	6	43	32	6	2	76.7	76.2	77.1	76.7	83.9	63.9	78.2	72.6	3.8	3.2	1.0	2.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
Aug.	4	8	12	37	28	3	1	0	74.4	72.9	74.1	74.0	80.1	67.7	77.3	73.2	2.8	3.2	1.0	2.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
Sept.	20	19	15	30	1	1	4	1	65.6	63.7	66.6	66.0	80.7	67.7	77.3	73.2	3.9	4.4	2.9	3.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
Oct.	15	22	27	11	3	2	1	9	53.1	53.8	54.7	53.9	80.6	68.2	78.3	76.0	4.2	3.7	2.4	3.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
Nov.	16	12	11	12	20	9	6	6	51.6	53.0	52.5	52.4	86.6	80.1	83.8	83.5	6.1	5.6	5.3	5.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
Dec.	142	102	123	265	285	85	41	50	741.9	744.9	753.8	747.1	992.1	830.9	948.3	973.7	58.1	57.6	39.9	51.7	0	12	29	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
Suma . .																																													
																								Percentages.																					
Means . .	12.9	9.3	11.2	24.1	28.0	7.7	3.7	4.6	61.8	62.1	62.8	62.2	82.7	68.2	79.0	77.0	4.8	4.8	3.3	4.3	38.5	41.8	19.7	32.5	0	3.3	7.9	9.3	0	0	0	0	0	0	0	0	0	0	0						

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.49 a. m., 1.49 p. m., and 9.49 p. m., local time. Correction for instrumental error of barometer used: From 5.49 a. m., January 1, to 9.49 p. m., December 31, 1884, inclusive,  $\pm .008$  inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.040; February, 0.040; March, 0.040; April, 0.040; May, 0.040; June, 0.040; July, 0.040; August, 0.040; September, 0.040; October, 0.040; November, 0.040; December, 0.040.

E. O'V. MACINERNEY,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

GRAND HAVEN, MICH.

Location of office on December 31, 1884, Cutler House, corner Third and Washington streets.

[Latitude, 43° 0' N.; longitude, 82° 19' W. Elevation of barometer above sea-level, 620 feet. Elevation of exposed thermometer above ground, 23 feet. Elevation of rain-gauge above ground, 78 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.			Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	Washington time.					Washington time.					Self-registering thermometers.					Any 3 consecutive 8-hourly measurements.			Maximum hourly velocity during month.			Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	7 a. m.		9 p. m.		11 p. m.	Monthly mean.	Maximum.	Minimum.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
	In.	W.	In.	W.														In.	W.	In.	W.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
1884.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						

\* One 7 a. m. observation taken late.

† January.

‡ April.

§ June.

|| December.

## GRAND HAVEN, MICH.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).				Number of days—																			
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Washington time.				Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 30°.	Thunder-storms.	Auroras.						
									7 a. m.	3 p. m.	11 p. m.	Mean.																								
1884.																																				
Jan.....	19	23	6	8	14	17	17	9	1	13.7	16.8	14.7	15.1	78.3	77.8	81.4	8.9	8.8	8.8	8.3	8.3	1	9	25	23	21	20	0	0	0	0	0				
Feb.....	8	23	5	15	13	5	9	16	4	17.6	21.9	20.2	19.9	83.8	81.4	83.8	8.8	8.6	8.6	8.3	8.3	0	7	22	26	18	27	0	0	0	0	0				
Mar.....	6	18	13	8	7	9	8	14	11	22.0	27.5	26.0	25.2	78.6	76.4	76.4	7.0	6.5	6.5	5.1	5.7	5	12	14	23	19	18	4	4	0	0	0				
Apr.....	13	14	13	2	5	8	14	17	4	31.5	32.0	31.0	31.5	64.3	64.6	64.6	6.5	5.5	5.5	5.1	5.7	5	12	13	9	9	4	4	0	0	0	0	0			
May.....	9	17	6	7	26	12	18	8	0	44.0	44.1	43.7	43.9	69.1	67.9	69.0	4.7	4.8	4.8	3.8	4.4	4	9	10	8	0	0	0	0	0	0	0	0			
June.....	4	20	14	2	15	13	15	1	5	56.7	58.0	56.8	56.8	72.8	69.0	72.8	4.6	4.7	4.8	3.8	4.4	7	21	8	10	0	0	0	0	0	0	0	0			
July.....	8	4	6	6	13	14	24	15	3	56.7	58.5	57.5	57.9	77.6	73.6	77.6	5.3	5.4	5.4	4.6	4.6	10	18	3	18	0	0	0	0	0	0	0	0			
Aug.....	7	9	4	10	14	15	13	18	2	56.6	57.8	57.0	56.8	77.4	75.5	77.4	4.9	4.7	4.7	3.1	3.1	8	14	8	10	0	0	0	0	0	0	0	0			
Sept.....	5	5	9	13	29	11	10	8	1	55.6	57.8	57.0	56.8	78.2	74.8	78.2	4.6	4.4	4.4	4.8	4.8	9	11	11	14	13	12	15	0	0	0	0	0			
Oct.....	6	4	9	11	28	17	10	9	1	44.4	46.4	45.0	45.3	76.6	74.6	76.6	7.3	7.0	7.0	5.1	5.8	9	11	14	14	13	12	15	0	0	0	0	0			
Nov.....	9	6	6	8	18	15	15	8	1	29.8	32.4	31.2	31.1	76.0	75.9	76.0	8.8	8.6	8.6	8.6	8.6	0	6	25	19	13	21	15	0	0	0	0	0			
Dec.....	3	9	9	7	18	11	13	11	2	21.8	25.1	22.9	23.3	80.5	81.1	80.5	8.8	8.6	8.6	8.6	8.6	0	6	25	19	13	21	15	0	0	0	0	0			
Sums ..	97	124	112	95	178	150	166	137	36	451.2	473.3	462.6	464.1	911.1	891.1	911.1	73.8	77.1	77.1	65.9	73.9	65	149	149	129	59	117	0	26	8	0	26	8			
Percentages.																											Percentage.									
8.81 310.2 8.71 313.7 15.1 112.5 2.3																																6.2 17.9 41.0 41.0 49.7 15.3 32.0 07.1 .8				

\* One 7 a. m. observation taken late.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.23 a. m., 2.23 p. m., and 10.23 p. m., local time.

Correction for instrumental error of barometer used: From 6.23 a. m., January 1, to 10.23 p. m., December 31, 1884, inclusive, +.002 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.710; February, 0.710; March, 0.700; April, 0.690; May, 0.690; June, 0.650; July, 0.650; August, 0.650; September, 0.660; October, 0.670; November, 0.700; December, 0.710.

REMARKS.—January 2 and 3, very severe gale; harbor entrance blockaded by ice the better portion of the month. February 12, severe elect-storm; harbor continued blockaded by heavy ice the better part of the month. March 22, heavy rise of Grand River causing damage to lumber-booms and clearing harbor of ice. April 17, 23, auroras. May 29, last light frost of season. September 21, first light frost of season; 13th, aurora. October 9, first killing frost of season; 17th, meteor. December 29 and 30, unusually warm.

JOSEPH E. MUELLER  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

GRANT, FORT, ARIZ.

Location of office on December 31, 1884, post quarters.

[Latitude, 32° 49' N.; longitude, 109° 57' W. Elevation of barometer above sea-level, 4,856 (H) feet. Elevation of exposed thermometer above ground, 6 feet. Elevation of rain-gauge above ground, 1 foot.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.				Precipitation.				Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
Month.	Washington time.				Monthly mean.	Washington time.				Self-registering thermometers.				Total amount.	Mean maximum.	Mean minimum.	Any 3 consecutive 8-hourly measurements.	Maximum hourly velocity during month.		Prevailing direction.	Miles.	Direction.	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	7 a. m.	3 p. m.	11 p. m.	Range.		7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.					Mean maximum.	Mean minimum.					Largest amount.	Date.	Miles.	Direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Jan.	25.280	25.352	25.271	25.298	25.604	1	25.032	10	472	33.4	48.7	42.0	41.4	59.4	8	18.8	1	40.6	52.3	32.7	1.12	69	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20	SE.	SE.	20</

\* Record for twenty-two days; minimum broken.

† January.

‡ December.

§ July.

GRANT, FORT, ARIZ.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).				Number of days—																		
	North.		Northeast.		East.		Southeast.		South.		Southwest.		West.		Northwest.		Number of calms.		Washington time.					Number of days—											
	North.	North-east.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Partly.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.		
1884.																																			
Jan.	10	13	12	16	10	9	8	15	0	23.4	25.1	24.0	23.8	64.6	41.7	50.3	52.2	3.8	3.4	2.5	3.2	2.5	3.2	4.6	13	18	9	4	4	0	16	0	0	0	0
Feb.	19	15	7	11	8	6	8	15	0	23.4	32.7	30.7	30.8	68.8	55.1	58.8	60.9	4.5	3.1	4.2	4.1	4.2	4.6	12	13	9	6	11	0	2	0	0	0	0	
Mar.	14	19	10	8	6	6	14	16	0	23.8	29.3	30.8	29.5	62.7	59.5	54.2	62.7	4.4	3.5	4.2	4.1	4.3	4.6	13	19	9	6	12	0	2	0	0	0	0	
Apr.	25	11	12	5	2	5	18	12	0	23.8	24.1	28.6	24.8	44.8	24.6	35.8	35.1	2.1	3.5	1.9	2.6	1.9	3.2	20	9	1	4	0	0	0	0	0	0	0	
May	22	10	11	13	9	4	15	9	4	27.7	28.0	30.0	28.6	38.0	21.1	31.0	30.0	2.1	2.6	1.6	2.1	2.6	2.2	22	7	2	6	0	0	0	0	0	0	0	
June	23	12	14	7	11	4	6	13	0	32.4	32.8	33.8	33.0	39.0	18.5	26.1	24.9	2.1	2.6	2.8	2.5	2.9	3.0	18	11	1	5	0	0	0	0	0	0	0	
July	18	7	12	11	9	4	10	21	1	45.8	49.5	51.5	50.3	40.2	21.5	33.1	31.6	2.3	2.9	3.9	3.0	3.9	4.1	17	12	2	6	0	0	0	0	0	0	0	
Aug.	17	10	9	13	5	3	11	9	3	44.1	49.5	51.5	50.3	57.6	21.5	33.1	31.6	3.9	4.1	4.6	4.2	4.6	4.3	11	15	4	5	0	0	0	0	0	0	0	
Sept.	21	17	18	12	7	2	5	15	3	44.1	46.2	44.0	44.8	63.8	45.1	42.3	42.3	1.8	2.8	1.5	2.0	1.5	2.4	13	15	3	8	0	0	0	0	0	0	0	
Oct.	7	15	18	34	7	5	3	8	1	44.2	46.2	44.0	44.8	63.8	45.1	42.3	42.3	3.6	3.9	2.4	3.3	2.4	3.4	13	15	3	8	0	0	0	0	0	0	0	
Nov.	9	13	12	16	6	9	5	11	30.9	35.5	31.9	32.8	55.3	35.2	46.3	45.6	59.2	1.9	2.2	0.9	1.7	0.9	2.2	24	4	2	3	0	0	0	0	0	0	0	
Dec.	20	20	2	16	12	5	11	7	23.9	32.7	23.6	28.1	66.8	50.6	60.2	59.2	59.2	4.5	4.9	4.4	4.6	4.4	4.9	14	7	10	11	0	0	7	0	0	0	0	
Sums ..	205	162	127	162	92	62	115	140	33	404.2	435.1	422.9	417.6	646.7	415.9	540.5	534.3	37.0	42.6	33.9	37.8	2.8	3.6	206	113	47	90	0	27	51	23	0	0		
Means .	13.6	14.7	11.6	14.7	8.4	6.6	10.5	12.8	3.0	23.7	35.4	35.2	34.8	53.9	34.7	45.0	44.5	3.1	3.6	2.8	3.2	2.8	3.6	55.3	30.9	12.8	24.6	0	7.4	13.9	6.3	0	0		

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.48 a. m., 12.48 p. m., and 8.48 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.010 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 4.80; February, 4.86; March, 4.83; April, 4.73; May, 4.61; June, 4.54; July, 4.57; August, 4.57; September, 4.60; October, 4.70; November, 4.84; December, 4.88.

REMARKS.—Last snow of spring occurred on March 24; last frost of spring occurred on May 3; first frost of autumn occurred on October 23, and first snow of winter occurred on December 10.

P. CONNOR,  
Corporal, Signal Corps, U. S. A.

*Meteorological summary for the last three months of the year ending December 31, 1884—Continued.*

GREENCASLE, IND.

Location of office on December 31, 1884, De Pauw University.

[Latitude, 39° 40' N.; longitude, 80° 53' W. Elevation of barometer above sea-level, 885 feet. Elevation of exposed thermometer above ground, 88 feet. Elevation of rain-gauge above ground, 68 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.				Wind.				Total movement.
	Washington time.			Monthly mean.			Highest.	Date.	Lowest.	Date.	Range.	In.	W.	Self-registering thermometers.					Total amount.		Any 2 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.				
	7 a. m.	3 p. m.	11 p. m.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	In.	W.	Date.	Largest amount.	Miles.	Direction.	Date.	Miles.		
																												7 a. m.	
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	
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Sept.																													
Oct.	30.229	30.164	29.197	29.203	29.516	15	28.915	8	601	52.8	64.6	58.1	57.785.8	2	28.2	24	57.0	64.4	50.4	1.27	96	26	27	24	SW.	21	SW.	8,845	
Nov.	29.153	29.126	29.146	29.142	29.552	6	28.562	23	996	30.1	48.8	38.7	40.964.1	1	9.7	24	54.4	49.6	33.0	1.73	60	22	28	29	SW.	23	SW.	5,465	
Dec.	29.163	29.139	29.168	29.167	29.631	19	28.418	6	1,213	26.1	80.7	27.2	28.050.3	6	-14.5	19	72.8	35.9	20.5	6.74	1.69	27	28	30	SE.	31	SE.	6,462	

Observations began 7 a. m., October 1.



## GREENCASTLE, IND.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.				Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Washington time.				Clear.				Fair.				Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond to 6.31 a. m., 2.31 p. m., and 10.31 p. m., local time.  
 Correction for instrumental error of barometer used: From 7 a. m., October 1, to 11 p. m., December 31, 1884, inclusive, +.002 inch.  
 REMARKS.—Station opened at 7 a. m., October 1, 1884.

ORIN PARKER,  
*Sergeant, Signal Corps, U. S. A.*

*Meteorological summary for the year ending December 31, 1884—Continued.*

HATTERAS, N. C.

Location of office on December 31, 1884, Neal's House.

[Latitude, 35° 15' N.; longitude, 75° 40' W. Elevation of barometer above sea-level, 12 feet. Elevation of exposed thermometer above ground, 7 feet. Elevation of rain-gauge above ground, 2 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	Washington time.					Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering ther- mometers.					Total amount.	Any 3 con- secutive 8-hourly meas- ure- ments.	Miles.	Direction.	Date.	Prevailing direction.	Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.							Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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\* January.

† April.

‡ September.

HATTERAS, N. C.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Washington time.				Percentage.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
									North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.06 a. m., 3.06 p. m., and 11.06 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.009 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.010; February, 0.010; March, 0.010; April, 0.010; May, 0.010; June, 0.010; July, 0.010; August, 0.010; September, 0.010; October, 0.010; November, 0.010; December, 0.010.

R. M. CRAWFORD,  
Private, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

HELENA, MONT.

Location of office on December 31, 1884, corner Price and Main streets.

[Latitude, 46° 24' N.; longitude, 112° 4' W. Elevation of barometer above sea-level, 4,044 (B) feet. Elevation of exposed thermometer above ground, 21 feet. Elevation of rain-gauge above ground, 57 feet.]

Barometer readings (corrected for temperature and instrumental error only).														Temperature.										Precipitation.			Wind.			Total movement.
Washington time.				Monthly mean.				Washington time.				Self-registering thermometer.						Any 3 consecutive 8-hourly measurements.		Total amount.	Maximum hourly velocity during month.		Prevailing direction.							
7 P. M.	3 P. M.	11 P. M.		High.	Date.	Low.	Date.	Range.	7 P. M.	8 P. M.	11 P. M.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Last 8 hours.	Date.	Miles.	Direction from—	Date.	Miles.				
1884.																														
Jan.	25.928	25.908	25.910	25.915	25.896	1	25.537	25	859	7.6	14.0	12.3	11.6	51.2	12	13.0	4	64.2	24.8	10.1	2.75	1.35	2,840	SW.	12	N.	2,840			
Feb.	25.778	25.778	25.801	25.786	25.779	26	25.101	17	1,178	11.8	17.6	14.8	14.6	532.0	24	20.0	11	72.0	22.4	7.3	1,333	2.1	4,5	23	NW.	3,789				
Mar.	25.715	25.718	25.702	25.712	25.644	13	25.138	10	.906	24.2	34.0	29.2	29	151.0	5	9.0	7	60.0	37.6	22.6	.59	.24	5	24	NW.	3,625				
Apr.	25.800	25.789	25.785	25.791	25.701	18	25.437	13	.673	35.1	47.9	41.7	41.7	631.0	22	28.0	28	37.0	51.4	33.8	1.06	.36	15	25	W.	4,080				
May	25.844	25.830	25.820	25.831	25.718	20	25.544	8	.574	44.7	61.7	55.3	53.9	976.0	23	31.5	1	44.5	65.5	43.9	.63	.29	28	25	SW.	4,884				
June	25.828	25.788	25.792	25.803	25.630	18	25.608	13	.442	55.2	69.5	63.9	62.9	988.0	10	43.5	25	42.5	74.3	54.2	4.29	.91	10	11	SW.	4,666				
July	25.865	25.833	25.837	25.845	25.712	8	25.541	6	.571	53.7	69.9	61.0	62.5	84.6	6	47.0	5	37.6	73.6	53.1	3.25	.30	22	34	SW.	4,979				
Aug.	25.901	25.890	25.868	25.883	25.694	20	25.644	26	.440	57.5	73.9	68.9	66	889.2	26	42.1	20	46.1	78.8	56.1	.47	.80	19	22	W.	4,635				
Sept.	25.796	25.785	25.793	25.791	25.617	19	25.504	30	.543	44.6	54.7	49.8	49	774.0	21	31.0	30	43.0	59.4	42.9	1.30	.48	4	5	SW.	4,523				
Oct.	25.836	25.826	25.844	25.835	25.252	16	25.280	1	.972	41.4	52.8	46.8	47	074.0	9	28.0	7	46.0	57.6	38.6	.49	.31	2	3	W.	4,631				
Nov.	25.912	25.919	25.914	25.915	25.157	30	25.617	20	.840	32.8	40.1	36.3	36	462.0	7	7.5	22	54.5	43.0	28.8	.46	.29	21	22	W.	3,664				
Dec.	25.782	25.767	25.775	25.775	25.243	9	25.315	20	.928	5.5	9.2	6.2	2	052.0	2	28.0	24	80.0	14.5	0.5	1.56	.50	18	24	NW.	2,866				
Suma.	309,963	309,819	309,841	309,882	28,896	†	25,101	†	8,628	413.6	545.3	490.2	433.1	827.4	604.9	391.9	19.18	.....	.....	.....	.....	.....	.....	.....	.....	.....	49,013			
Means.	25.822	25.818	25.820	25.823	25.806	.....	25.101	.....	.719	34.5	45.4	40.8	40	286.2	58	23.0	24	52.3	50.4	32.7	.....	.....	.....	.....	.....	.....	.....			
* 14 days.																														
† January.														† February.					† August.					† December.						

**HELENA, MONT.—Continued.**

Month.	Winds at 7 a. m., 3 and 11 p. m.; Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—										
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.			3 p. m.			11 p. m.			Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Part.	Cloudy.	(In which .01 inch or more precipitation fell.	Maximum below 82°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.
										7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.															
1884.																																
Jan.	30	7	1	0	0	3	13	26	14	2.4	5.3	8.3	20.0	72.9	60.9	76.2	74.6	5.9	7	12	12	11	21	30	0	0	0	0	0	0		
Feb.	11	5	0	0	0	14	19	28	11	3.5	8.3	15.5	20.0	75.5	60.6	76.2	74.6	5.0	8	17	9	16	23	0	0	0	0	0	0	0		
Mar.	21	13	0	0	1	22	9	22	3	17.5	31.4	31.2	26.0	75.5	60.6	76.2	74.6	4.8	11	13	7	6	21	22	0	0	0	0	0	0		
Apr.	18	10	0	0	1	22	9	22	3	28.0	27.5	28.0	28.0	75.5	60.6	76.2	74.6	4.8	11	13	7	6	21	22	0	0	0	0	0	0		
May	18	9	1	0	1	23	16	8	3	34.2	34.7	35.6	34.0	67.9	39.2	49.2	52.1	4.2	8	14	8	12	0	10	0	0	0	0	0	0		
June	13	7	3	0	10	28	4	3	2	45.0	45.2	45.9	45.4	69.4	44.8	54.2	53.8	4.7	10	15	9	8	0	1	0	0	0	0	0	0		
July	11	11	5	1	1	38	19	9	2	40.9	40.9	42.5	43.9	70.5	40.5	52.0	54.3	4.1	9	15	9	16	0	0	0	0	0	0	0	0		
Aug.	10	9	11	0	3	40	15	3	2	33.4	32.9	33.2	33.2	66.3	45.6	55.2	53.7	3.9	16	13	2	11	0	0	0	0	0	0	0	0		
Sept.	17	6	2	0	0	30	24	6	2	28.9	29.2	28.6	28.9	62.0	41.4	50.5	51.8	3.6	7	16	7	9	0	1	0	1	0	1	0	1		
Oct.	6	1	4	0	0	13	58	11	0	22.5	23.5	22.9	23.0	66.5	53.4	59.6	59.8	3.5	13	15	3	4	0	0	0	0	0	0	0	0		
Nov.	22	2	0	0	0	6	27	11	1	22.5	23.5	22.9	23.0	66.5	53.4	59.6	59.8	3.5	13	15	3	4	0	0	0	0	0	0	0	0		
Dec.	21	7	0	0	0	5	27	29	3	2.1	3.0	1.9	71.8	64.5	64.5	66.9	67.6	4.6	8	20	3	11	23	27	0	0	0	0	0	0		
Sum.	198	85	35	5	29	252	277	170	47	293.4	300.6	315.1	307.8	832.3	600.4	710.9	714.5	51.2	115	178	73	169	69	138	0	10	3					
	Percentages.																															
Means.	15.0	7.7	3.2	0.5	2.6	23.0	21.5	5.4	4.8	31.4	43.6	19.9	20.8	13.9	37.1	...	27.0	4.8	31.4	43.6	19.9	20.8	13.9	37.1	...	27.0	3					

\* 14 days.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time correspond to 4.40 a. m., 12.40 p. m., and 8.40 p. m., local time. Corrections for instrumental error of barometer used: From 7 a. m., January 3, +.007 inch; 3 p. m., November 2, to 11 p. m., December 31, +.005 inch.

1894.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 4.38; February, 4.35; March, 4.23; April, 4.21; May, 4.12; June, 4.07; July, 4.01; August, 4.04; September, 4.12; October, 4.23; November, 4.32; December, 4.32.

**A. L. MATHEWS,**  
*Sergeant, Signal Corps, U. S. A.*





*Meteorological summary for the year ending December 31, 1884—Continued.*

INDIANAPOLIS, IND.

Location of office on December 31, 1884, Fletcher and Sharpe's Block, corner of Washington and Pennsylvania streets.

[Latitude, 39° 40' N.; longitude, 86° 10' W. Elevation of barometer above sea-level, 753 feet. Elevation of exposed thermometer above ground, 53 feet. Elevation of rain-gauge above ground, 74 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.			Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	Washington time.				Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometer.						Total amount.	Any 3 consecutive 8-hourly measurements.	Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	7 P. M.	3 P. M.	11 P. M.	7 P. M.							3 P. M.	11 P. M.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.			Mean minimum.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In

\* January.

† April.

‡ June.



## INDIANAPOLIS, IND.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.	Relative humidity (per cent.).		Cloudiness (in tenths).					Number of days—															
	Number of calms.																															
	North.	North-east.	East.	South-east.	South.	South-west.	West.	North-west.																								
	Washington time.																															
1884.	Jan.	12	7	5	2	16	19	17	14	1	11.1	12.8	12.7	12.2	72.7	58.0	71.0	67.2	6.4	5.6	4.3	5.4	17	28	0	0	0	0	0	0		
	Feb.	8	5	13	6	17	11	5	20	2	24.9	28.4	27.9	75.4	64.6	77.4	73.1	7.1	7.1	6.7	7.4	9	18	9	18	0	0	0	0	0	0	
	Mar.	10	9	12	13	15	6	7	20	1	26.9	28.5	28.4	71.9	52.1	64.3	63.4	6.5	6.5	6.9	6.9	3	14	7	16	0	0	0	0	0	0	
	Apr.	12	11	8	16	9	4	12	16	3	33.7	35.3	34.4	66.1	49.5	61.6	63.4	7.1	7.1	7.5	7.5	8	17	7	17	0	0	0	0	0	0	
	May	8	12	4	7	11	22	9	17	3	47.1	46.6	49.1	47.6	71.0	48.3	69.0	62.0	6.0	5.8	3.6	3.6	10	13	0	0	0	0	0	0	0	
	June	3	11	14	17	19	6	3	6	11	59.0	59.8	60.4	59.7	71.7	53.0	69.0	64.6	5.5	5.8	4.3	5.4	8	12	0	0	0	0	0	0	0	0
	July	16	8	2	2	6	17	14	20	8	60.0	58.8	61.5	60.1	72.9	50.6	70.1	64.5	5.5	6.0	4.5	5.4	10	13	0	0	0	0	0	0	0	0
	Aug.	16	11	5	1	19	12	9	14	6	56.7	55.6	57.2	56.7	73.0	43.8	63.8	60.2	3.3	5.5	3.9	3.6	17	12	0	0	0	0	0	0	0	0
	Sept.	3	7	4	9	35	14	2	9	7	56.7	55.6	57.2	56.7	73.0	43.8	63.8	60.2	3.3	5.5	3.2	3.9	17	12	0	0	0	0	0	0	0	0
	Oct.	5	14	7	8	19	15	8	10	6	47.4	47.7	49.4	48.2	54.2	75.1	71.8	71.8	4.3	4.4	2.7	2.8	13	14	4	4	1	1	1	1	1	1
	Nov.	7	8	6	29	7	12	14	13	0	32.7	35.6	35.5	34.6	87.6	63.8	82.3	77.9	4.5	4.5	3.7	4.2	13	10	7	22	1	1	1	1	1	1
	Dec.	7	8	6	29	7	12	14	13	0	32.7	35.6	35.5	34.6	87.6	63.8	82.3	77.9	4.5	4.5	3.7	4.2	13	10	7	22	1	1	1	1	1	1
	Sums ..	106	108	85	113	189	155	119	169	54	490.3	491.8	503.7	491.9	910.8	697.2	854.5	810.8	70.0	75.5	55.2	64.7	99	144	123	160	40	91	5	57	1	1
Means.									Percentages.								Percentages.															





*Meteorological summary for the year ending December 31, 1884—Continued.*

JACKSONVILLE, FLA.

Location of office on December 31, 1884, Astor Building, corner Bay and Hogan streets.

[Latitude 30° 20' N.; longitude 81° 39' W. Elevation of barometer above sea-level, 43 feet. Elevation of exposed thermometer above ground, 37 feet. Elevation of rain-gauge above ground, 54 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.				Total movement.						
Washington time.				Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometer.			Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.	Date.	Maximum hourly velocity during month.		Prevailing direction.					
7 p. m.	3 p. m.	11 p. m.								Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.						7 a. m.			3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.
Month.	In.	In.	In.	In.	In.	In.	In.	In.	In.	°	°	°	°	°	°	°	°	°	In.	In.	24, 25, 26	W.	8	N.	Miles.			
1884.																												
Jan.	30.207	30.148	30.202	30.186	30.534	21	29.669	8	865	46.4	58.6	50.1	51.7	72.2	31	21.0	6	51.2	61.0	43.1	4.78	1.51	24, 25, 26	W. <td>8</td> <td>N.</td> <td>3, 060</td>	8	N.	3, 060	
Feb.	30.106	30.036	30.097	30.087	30.300	11	29.044	28	650	64.4	69.4	60.5	62.1	79.0	13	36.8	29	42.2	71.7	54.6	2.45	.88	17, 18, 29	SW. <td>19</td> <td>N.W.</td> <td>4, 279</td>	19	N.W.	4, 279	
Mar.	30.075	30.014	30.090	30.050	30.349	19	29.762	28	597	61.1	73.5	64.2	66.8	85.2	25	42.4	1	42.8	75.3	53.8	2.63	1.58	13, 14, 25	SW. <td>1</td> <td>SW.</td> <td>5, 528</td>	1	SW.	5, 528	
Apr.	29.962	29.900	29.915	29.936	30.151	6	29.611	1	540	63.4	76.1	66.6	68.7	88.5	30	47.2	10	41.3	77.1	60.6	2.32	.93	5, 6, 38	W. <td>2</td> <td>SW.</td> <td>5, 832</td>	2	SW.	5, 832	
May	29.935	29.834	29.873	29.864	30.184	3	29.746	27	438	73.1	83.2	73.8	76.5	90.7	25	62.3	31	28.4	85.2	69.3	5.43	2.02	29, 32	SW. <td>25</td> <td>SW.</td> <td>5, 053</td>	25	SW.	5, 053	
June	29.998	29.900	29.896	29.981	30.136	16	29.694	11	442	74.7	82.2	73.8	76.9	91.6	26	61.7	1	29.9	84.4	70.1	6.89	1.48	22, 28	SW. <td>11</td> <td>SW.</td> <td>5, 207</td>	11	SW.	5, 207	
July	29.973	29.926	29.959	29.953	30.113	23	29.793	16	320	80.0	88.6	80.0	88.9	95.9	6	69.2	9	26.7	90.6	75.9	6.09	2.65	16, 28	W. <td>6</td> <td>SW.</td> <td>5, 590</td>	6	SW.	5, 590	
Aug.	30.004	29.962	30.003	29.990	30.157	20	29.815	31	342	76.9	85.2	77.2	79.8	93.5	21	70.0	24	23.5	88.1	72.4	5.21	.90	8, 24	W. <td>12</td> <td>NE.</td> <td>3, 451</td>	12	NE.	3, 451	
Sept.	30.035	29.999	30.038	30.024	30.216	30	29.801	10	405	72.9	83.5	70.6	77.7	89.1	12	64.2	17	24.9	81.9	70.7	5.69	2.32	4, 5, 21	E. <td>20</td> <td>N.E.</td> <td>4, 133</td>	20	N.E.	4, 133	
Oct.	30.075	30.023	30.066	30.054	30.327	20	29.847	9	480	68.6	79.3	70.6	72.8	91.7	7	49.4	25	42.8	80.6	65.6	4.12	1.99	12, 13, 22	N. <td>21</td> <td>N.E.</td> <td>4, 659</td>	21	N.E.	4, 659	
Nov.	30.082	30.028	30.069	30.060	30.251	6	29.609	28	592	54.0	69.1	60.1	61.7	78.8	4	39.0	26	39.8	70.5	54.1	5.43	2.75	17, 28	W. <td>28</td> <td>N.E.</td> <td>3, 941</td>	28	N.E.	3, 941	
Dec.	30.135	30.076	30.120	30.116	30.359	27	29.794	6	565	53.6	63.9	57.7	58.4	74.6	12	33.9	19	41.7	65.9	51.4	4.04	1.16	5, 16, 24	S, W. <td>18</td> <td>N.</td> <td>4, 285</td>	18	N.	4, 285	
Sums	360.637	360.038	360.518	360.399	.....	.....	.....	.....	6, 242	784.1	912.6	810.1	835.6	.....	.....	.....	434.7	935.3	874.6	555.02	.....	.....	.....	.....	56, 428	N.E.	.....	.....
Means.	30.063	30.003	30.043	30.033	30.534	21	29.611	16	520	65.3	76.0	67.5	69.6	95.9	6	21.0	6	36.2	77.9	62.2	.....	.....	.....	.....	.....	.....	.....	.....

\* January.

† April.

‡ July.

## JACKSONVILLE, FLA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Washington time.				Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.42 a. m., 2.42 p. m., and 10.42 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, .0090 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, .0050; February, .0050; March, .0050; April, .0040; May, .0040; June, .0040; July, .0040; August, .0040; September, .0040; October, .0040; November, .0030; December, .0030.

REMARKS.—From January 3 to 7, inclusive, freezing weather occurred. The temperature has never before fallen to freezing point so many consecutive days since the establishment of this station. Large quantities of fruits and vegetables were destroyed and many orange, lemon, lime, and other trees damaged.

J. W. SMITH,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

KEOKUK, IOWA.

Location of office on December 31, 1884, State National Bank, corner of Second and Main streets.

[Latitude, 40° 22' N.; longitude, 91° 20' W. Elevation of barometer above sea-level, 618 feet. Elevation of exposed thermometer above ground, 47 feet. Elevation of rain-gauge above ground, 60 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	Washington time.					Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.					Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Largest amount.		Date.	Maximum hourly velocity during month.			Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	7 P. M.	3 P. M.	11 P. M.	In.	In.							In.	7 A. M.	3 P. M.	11 P. M.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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\*January.

†March.

‡July.

**KROKUK, IOWA--Continued.**

[illegible]

**\* 30 days.**

**+11 days.**

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.02 a. m., 2.02 p. m., and 10.02 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884 inclusive, +.025 inch.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.02 a. m., 2 02 p. m., and 10.02 p. m. local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive,  $\pm .025$  inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.700; February, 0.700; March, 0.690; April, 0.670; May, 0.650; June, 0.640; July, 0.630; August, 0.630; September, 0.650; October, 0.670; November, 0.690; December, 0.710. REMARKS.—January, unusually cold, 2–8; March, navigation opened, 25; flood began, 27; April, flood ended, 8; last snow-storm, 7–8; last frost, 24; August, drought until 16; September, light frost in vicinity, 28; March, navigation closed, 12; first light frost, 23; November, first light snow, 17; first regular snow-storm, 29; ice running in river, 28–30; December, navigation closed, 12; river frozen, 20.

FRED. S. GOSEWITSCH, *Sergeant, Signal Corps, U. S. A.*

*Meteorological summary for the year ending December 31, 1884—Continued.*

KEY WEST, FLA.

Location of office on December 31, 1884, Wall & Co.'s building, Front street, between Duval and Fitzpatrick streets.

[Latitude, 24° 24' N.; longitude, 81° 49' W. Elevation of barometer above sea-level, 20 feet. Elevation of exposed thermometer above ground, 20 feet. Elevation of rain-gauge above ground, 42 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.			Wind.			Total movement.	
Washington time.					Monthly mean.					Washington time.					Self-registering thermometers.					Any 2 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.			
7 p. m.	3 p. m.	11 p. m.	In.	In.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Abnormal range.	Mean maximum.	Mean minimum.	Total amount.	Large amount.	Date.		Miles.		Direction.

\* One 7 a. m. observation missed.

† One 11 p. m. observation missed.

‡ January.

§ April.

|| August.



## KEY WEST, FLA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—										Number of calms.	Dew-point.					Relative humidity (per cent.).	Cloudiness (in tenths).					Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
	North.					South.						Dew-point.						Clear.	Fair.	Cloudy.	On which more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
	North-east.	East.	South-east.	South.	West.	North-west.	North-east.	East.	South-east.	South.		West.	North-west.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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*Meteorological summary for the year ending December 31, 1884—Continued.*

KITTY HAWK, N. C.

Location of office on December 31, 1884, Life-Saving Station No. 12.

[Latitude, 36° N.; longitude, 75° 42' W. Elevation of barometer above sea-level, 9 feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain-gauge above ground, 2 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.						
Month.	Washington time.				Monthly mean.	Washington time.				Self-registering thermometers.						Total amount.	Mean maximum.	Mean minimum.	Any 8 consecutive hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.	Total movement.				
	7 a. m.	3 p. m.	11 p. m.	Range.		Date.	Lowest.	Highest.	Date.	Minimum.	Date.	Absolute range.	Maximum.	Minimum.	Date.				Largest amount.	Date.	Miles.	Direction from—						
1884.																												
Jan.	30.198	30.163	30.191	30.181	30.783	27	29.868	8	1.415	36.7	41.1	37.4	38.4	38.4	38.4	24	0	0	0	0	0	0	1.95	18.19	64	SE.	NE.	12,776
Feb.	30.110	30.097	30.136	30.112	30.628	16	29.332	28	1.296	48.1	53.3	47.8	49.7	49.7	49.7	1	21.1	29	50.0	58.8	41.3	4.32	1.67	20.56	SW.	SW.	10,862	
Mar.	30.056	29.997	30.058	30.037	30.412	16	29.577	29	0.835	46.4	53.9	47.7	49.3	49.3	49.3	26	21.5	7	49.5	57.1	41.3	9.17	1.64	28.47	N.	NE.	10,924	
Apr.	29.914	29.872	29.910	29.896	30.253	12	29.232	2	1.021	50.1	54.9	50.1	51.7	51.7	51.7	0	38.0	7	45.9	58.2	45.8	4.83	1.72	18.48	NE.	NE.	10,288	
May	30.006	29.969	29.995	29.990	30.334	8	29.714	11	0.610	63.8	71.1	63.1	65.8	65.8	65.8	24	42.5	1	46.5	74.2	58.0	1.75	4.46	27.37	NE.	SW.	9,272	
June	30.081	30.050	30.058	30.063	30.333	16	29.613	10	0.690	69.2	75.0	69.2	71.1	71.1	71.1	23	52.0	17	39.0	77.6	64.5	4.57	2.12	14	0	NE.	SW.	10,208
July	29.837	29.908	29.929	29.925	30.136	22	29.733	13	0.403	75.1	81.5	74.5	77.0	77.0	77.0	25	61.5	21	35.2	84.0	70.1	10.76	2.87	11.12	34	SW.	SW.	10,004
Aug.	30.054	30.037	30.051	30.047	30.238	25	29.688	31	0.550	74.0	78.8	74.0	75.6	75.6	75.6	30	68.0	14	24.7	80.9	71.2	6.58	1.93	7.26	NE.	NE.	10,441	
Sept.	30.145	30.114	30.136	30.132	30.316	14	29.800	17	0.516	72.6	80.1	72.6	75.1	75.1	75.1	8	61.7	6	26.6	81.2	69.3	1.15	1.07	24.50	NE.	NE.	9,872	
Oct.	30.171	30.131	30.155	30.152	30.537	26	29.854	18	0.703	63.6	71.9	64.8	66.8	66.8	66.8	4	42.1	25	43.0	73.8	69.8	1.23	1.04	30.31	NE.	NE.	10,278	
Nov.	30.120	30.080	30.098	30.098	30.435	22	29.470	28	0.965	52.2	58.6	55.0	55.3	55.3	55.3	23	34.9	25	34.9	61.2	48.6	7.14	4.04	16	NW.	NE.	10,171	
Dec.	30.193	30.150	30.174	30.173	30.567	20	29.734	6	0.833	45.9	50.8	48.8	48.5	48.5	48.5	31	14.7	19	53.1	55.1	41.2	5.65	1.89	21.22	60	N.	N.	12,772
Sums	300.985	300.558	300.595	300.599	300.909	.....	.....	.....	9.887	997.2	771.0	705.0	724.3	.....	.....	.....	.....	.....	.....	496.8	807.9	642.8	82.65	.....	.....	.....	.....	128,908
Means	30.062	30.046	30.074	30.067	30.763	127	29.232	12	0.824	58.1	64.2	58.8	60.4	60.7	60.7	735	8.6	16	41.4	67.3	53.5	.....	.....	.....	.....	NE.	NE.	.....

\* One 7 a. m., one 11 p. m., and one 3 p. m., observation not taken.

† January.

‡ April.

§ July.

KITTY HAWK, N. C.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	Number of calms.								7 a. m.				11 p. m.				Mean.				7 a. m.				8 p. m.				11 p. m.				Mean.				Clear.				Fair.				Cloudy.				On which .01 inch or more precipitation fell.				Maximum below 32°.				Minimum below 32°.				Maximum above 90°.				Thunderstorms.				Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
									North.				Northeast.				East.				Southeast.				South.				Southwest.				West.				Northwest.				Mean.				7 a. m.				8 p. m.				11 p. m.				Mean.				Clear.				Fair.				Cloudy.				On which .01 inch or more precipitation fell.				Maximum below 32°.				Minimum below 32°.				Maximum above 90°.				Thunderstorms.				Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
1884.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Sums	Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				Percentages.				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*Meteorological summary for the year ending December 31, 1894—Continued.*

KNOXVILLE, TENN.

Location of office on December 31, 1894, Custom-house building, corner of Prince and Church streets.

[Latitude, 35° 59' N.; longitude 83° 58' W. Elevation of barometer above sea-level, 980 feet. Elevation of exposed thermometer above ground, 73 feet. Elevation of rain-gauge above ground, 77 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
	Washington time.					Monthly mean.					Highest.		Lowest.		Range.		Date.		Washington time.		Self-registering thermometers.				Any 3 consecutive hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	7 p. m.	8 p. m.	11 p. m.	Monthly mean.		Date.		Range.		Date.		Mean maximum.		Mean minimum.		Total amount.		Largest amount.		Date.		Miles.		Direction from—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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\* January.

† April.

‡ October.

## KNOXVILLE, TENN.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—								Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.				Washington time.								Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.32 a. m., 2.32 p. m., and 10.32 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive,  $\pm .023$  inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.080; February, 1.080; March, 1.080; April, 1.040; May, 1.020; June, 1.010; July, 1.010; August, 1.010; September, 1.020; October, 1.040; November, 1.070; December, 1.080.

REMARKS.—Destructive hail-storm March 25. Earthquake shock August 24.

JNO. A. CODY,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1894—Continued.*

KNOXVILLE, TENN.

Location of office on December 31, 1894, Custom-house building, corner of Prince and Church streets.

[Latitude, 35° 56' N.; longitude 83° 58' W. Elevation of barometer above sea-level, 920 feet. Elevation of exposed thermometer above ground, 73 feet. Elevation of rain-gauge above ground, 77 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.				Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	Washington time.					Monthly mean.					Highest.					Lowest.					Date.					Range.					Washington time.					Self-registering thermometers.					Mean maximum.		Mean minimum.		Total amount.		Any 3 consecutive hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
	7 p. m.	9 p. m.	11 p. m.					Highest.	Date.	Lowest.	Date.	Range.	7 p. m.	9 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Large amount.	Date.	Miles.		Direction.	Date.	Miles.	Direction.	Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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\* January.

† April.

‡ October.

## KNOXVILLE, TENN.—Continued.

Month.	Winds at 7 a. m., 3 p. m., and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.	Relative humidity (per cent.).	Cloudiness (in tenths).				Number of days—											
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.			Number of calms.	Washington time.				Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunderstorms.	Auroras.		
												7 a. m.	3 p. m.	11 p. m.	Mean.										7 a. m.	3 p. m.
1884.																										
Jan.....	14	21	3	3	2	16	22	8	22.0	24.1	24.6	23.6	88.8	67.2	83.6	78.9	6.3	9	11	14	14	23	0	0	0	
Feb.....	6	14	10	0	6	26	11	7	37.4	36.4	40.1	37.9	85.5	58.9	80.4	74.9	5.8	7	9	13	17	9	0	0	0	
Mar.....	9	21	9	3	2	22	16	3	37.4	38.1	40.8	38.8	82.2	57.5	75.3	71.6	6.4	6	13	13	16	9	0	0	0	
Apr.....	6	20	2	1	8	19	18	9	42.1	40.0	43.1	41.7	80.2	48.7	68.9	65.9	6.4	9	11	10	15	1	0	0	0	
May.....	16	18	19	0	2	17	19	5	54.8	51.9	54.5	53.7	84.0	45.9	70.4	68.3	3.7	4	11	10	12	0	0	0	0	
June.....	13	23	8	7	7	14	8	5	62.4	60.8	64.1	62.4	88.2	55.8	83.2	75.7	6.3	3	17	10	18	0	0	0	0	
July.....	8	14	1	0	7	13	14	4	66.6	64.3	67.5	66.1	90.5	56.6	85.4	77.5	4.6	9	16	6	16	0	0	0	0	
Aug.....	13	25	5	8	2	14	9	5	63.5	61.3	64.8	63.2	90.5	50.2	81.3	74.0	4.9	4	9	4	10	0	0	0	0	
Sept.....	11	32	9	3	6	13	5	1	60.7	58.0	63.2	62.0	88.7	44.3	80.5	71.2	3.7	12	18	4	8	0	0	0	0	
Oct.....	18	20	3	10	4	7	0	8	52.7	50.0	53.3	52.0	88.0	43.2	74.8	69.9	3.4	7	12	3	2	0	0	0	0	
Nov.....	9	19	7	6	5	9	8	5	55.0	53.0	57.3	55.8	88.3	47.2	78.3	71.3	3.4	18	7	6	0	0	0	0	0	
Dec.....	15	18	13	5	3	11	15	5	31.2	33.4	36.3	32.3	86.6	61.4	78.4	73.5	6.7	6	13	12	2	14	0	0	0	
Sums ..	138	245	79	44	53	201	154	60	565.6	553.3	585.6	568.1	1040.5	636.9	893.4	872.3	50.1	124	147	95	143	11	64	19	56	
Percentages.																										
Means .	12.6	22.3	7.2	4.0	4.8	18.3	14.0	5.5	47.1	46.1	48.8	47.3	86.7	53.1	78.3	72.7	4.9	33.9	40.2	36.0	39.1	3.0	17.5	2.1	5.0	3.0
Percentages.																										

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.32 a. m., 2.32 p. m., and 10.32 p. m. local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.023 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.080; February, 1.080; March, 1.080; April, 1.080; May, 1.020; June, 1.010; July, 1.000; August, 1.010; September, 1.020; October, 1.040; November, 1.070; December, 1.080.

REMARKS.—Destructive hail-storm March 25. Earthquake shock August 24.

JNO. A. CODY,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

L.A. CROSSE, WIS.

Location of office on December 31, 1884, Opera House.

[Latitude, 43° 49' N.; longitude, 91° 15' W. Elevation of barometer above sea-level, 725 feet. Elevation of exposed thermometer above ground, 46 feet. Elevation of rain-gauge above ground, 67 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.				Wind.											
Washington time.			Monthly mean.			Highest.			Lowest.			Range.			Washington time.			Self-registering thermometer.			Any 3 consecutive 8-hourly measurements.			Maximum hourly velocity during month.		Prevailing direction.	Total movement.				
7 p. m.	3 p. m.	11 p. m.	In.	In.	In.	Date.	In.	Date.	In.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Miles.	Total movement.			
1884.																															
Jan.....	29.362	29.843	29.357	29.354	29.819	5	28.610	13	1.209	1.008	12.4	22.2	13.9	11.7	11.4	45.0	29	29.0	5	74.0	20.0	1.9	.53	24	27	25	N.	112	3	6,259	
Feb.....	29.247	29.229	29.235	29.237	29.707	10	28.698	19	1.009	1.009	12.4	22.2	13.9	11.7	17.9	43.0	18	10.0	15	53.0	28.0	8.7	1.42	35	4.5	25	N.	27	3	5,689	
Mar.....	29.221	29.208	29.223	29.217	29.599	14	28.298	11	1.331	1.331	23.5	34.9	30.1	29.5	39.5	56.0	27	10.0	4	76.0	30.5	21.1	1.11	.42	22	30	SE.	10	30	5,824	
Apr.....	29.183	29.143	29.107	29.124	29.746	21	28.535	27	1.211	1.211	40.8	52.0	46.6	46.6	54.5	75.0	30	27.5	7	47.5	54.5	38.2	3.07	.68	1	33	N.	15	30	5,857	
May.....	29.164	29.130	29.154	29.143	29.634	29	28.900	8	1.224	1.224	54.8	66.2	60.1	60.4	77.9	30	31.0	4	42.5	67.6	52.2	1.82	.38	6	29	NW.	1	20	5,807		
June.....	29.255	29.221	29.237	29.254	29.547	14	28.835	4	1.003	1.003	65.8	76.7	68.6	69.9	80.0	30	51.4	10	38.4	78.1	62.4	2.94	.37	21	40	N.	30	1	4,068		
July.....	29.151	29.129	29.120	29.138	29.438	20	28.835	4	1.003	1.003	65.8	75.2	68.6	69.9	81.0	22	55.0	4	84.2	76.6	62.2	2.94	.37	21	40	N.	30	1	4,211		
Aug.....	29.238	29.207	29.208	29.218	29.583	29	28.835	9	1.003	1.003	65.8	75.2	68.6	69.9	81.0	22	55.0	4	84.2	76.6	62.2	2.94	.37	21	40	N.	30	1	5,166		
Sept.....	29.190	29.143	29.164	29.166	29.596	12	28.694	23	1.012	1.012	60.8	78.6	63.9	65.9	89.0	8	49.5	20	88.5	74.7	59.3	4.01	.69	6	7	SE.	5	5	6,599		
Oct.....	29.284	29.250	29.281	29.275	29.734	14	28.837	5	1.087	1.087	49.5	59.4	53.3	54.1	84.0	8	49.5	20	88.5	74.7	59.3	4.01	.67	1	31	N.	8	5	6,008		
Nov.....	29.296	29.268	29.281	29.285	29.694	6	28.821	22	1.087	1.087	49.5	59.4	53.3	54.1	84.0	8	49.5	20	88.5	74.7	59.3	4.01	.67	1	31	N.	8	5	5,774		
Dec.....	29.206	29.239	29.208	29.202	29.934	25	28.664	6	1.270	1.270	14.1	20.2	17.2	17.2	46.0	4	28.0	25	72.0	23.9	11.1	2.25	.59	20	31	NW.	8	23	5,225		
Sums.....	350	306	350	350	715	350	728		11	314	485.7	610.9	543.0	546.7					683.1	1,451.8	83.31				28	28	N.	8	35	54,543	
Means.....	29.242	29.213	29.220	29.227	29.834	25	28.268	11	.943	.943	40.5	50.9	45.2	45.6	50.1	0	522	29.0	15	52.8	58.2	37.6									

\* One 11 p. m. observation taken late.

† December.

‡ March.

§ July.

|| January.



LA CROSSE, WIS.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—								River.																	
	Number of calms.								7 a. m.		8 p. m.		11 p. m.		Mean.		7 a. m.		8 p. m.		11 p. m.		Mean.		Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 82°.	Minimum below 82°.	Maximum above 90°.	Thunder-storms.	Auroras.	Highest.	Date.	Lowest.	Date.	Range.	Mean.	
									Washington time.																															
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 82°.	Minimum below 82°.	Maximum above 90°.	Thunder-storms.	Auroras.	Ft. In.	Highest.	Date.	Lowest.	Date.	Range.	Mean.				
1884																																								
Jan....	16	2	0	4	23	11	21	16	0	1.1	7.1	4.6	4.8	78.7	68.1	72.8	73.2	5.2	4.2	4.2	4.5	9	15	7	9	23	31	0	0	0	0	0	0	0	0	0	0	0	0	0
Feb....	21	10	0	2	22	5	9	17	1	6.2	14.7	12.1	11.0	75.6	72.3	74.4	74.1	7.0	7.0	6.9	7.0	1	13	15	18	12	23	0	0	0	0	0	0	0	0	0	0	0	0	0
Mar....	19	9	3	6	20	10	8	18	0	15.9	23.3	31.7	20.3	72.6	66.0	71.6	70.1	6.1	6.9	4.7	5.6	9	10	12	12	12	18	0	0	0	0	0	0	0	0	0	0	0	0	0
Apr....	20	10	6	16	9	4	13	11	0	31.5	31.6	33.2	32.1	70.0	50.2	61.4	60.5	6.2	6.7	4.7	5.5	10	8	11	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
May....	17	9	5	3	26	10	12	10	1	41.6	41.0	45.3	42.6	64.0	44.3	60.3	53.2	5.0	5.0	4.4	4.8	12	10	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
June....	11	9	6	13	34	7	3	2	5	57.4	53.8	59.5	53.6	75.4	57.5	73.2	68.7	4.8	5.3	2.5	4.2	11	15	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
July....	11	2	0	4	24	11	15	19	7	57.5	53.3	59.9	57.9	75.4	54.2	73.5	67.7	4.1	5.8	3.5	4.5	11	14	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aug....	4	2	1	5	38	13	9	18	3	57.1	60.5	60.6	59.4	82.4	61.7	73.2	74.1	4.6	5.1	2.0	3.9	11	18	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sept....	5	2	2	8	41	8	10	4	56.5	63.5	60.0	60.0	85.8	71.4	81.8	73.7	4.4	4.5	3.5	4.1	11	15	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct....	8	2	3	3	36	10	15	16	1	43.6	43.8	45.8	45.4	80.3	64.1	76.2	73.5	4.5	5.2	4.5	4.7	10	15	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nov....	17	4	0	4	29	5	6	21	1	23.1	23.6	23.4	25.7	65.5	74.0	71.7	4.9	4.9	4.2	4.7	11	10	9	12	8	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dec....	29	1	0	5	21	1	13	23	0	8.3	11.5	11.3	10.4	77.0	63.8	77.2	74.3	6.7	6.1	6.0	6.3	7	9	15	17	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sums ..	178	62	23	73	323	95	134	181	23	398	3443	7440	4277	7912	7744	1874	6843	853	564	751	159	8	113	153	100	161	81	127	1	38	3	3	3	3	3	3	3	3		
Percentages.																																								
Means ..	16.2	5.2	0.9	7.2	26.7	4.8	7.1	21.6	5.2	33.2	37.0	35.6	76.1	62.0	72.9	70.3	5.2	5.4	4.3	5.0	31.0	44.1	34.7	4.4	0.2	3.4	7.0	3.1	4.0	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8		

14 days.

26 days.

17 days.

\* One 11 p. m. observation taken late.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.02 a. m., 2.03 p. m., and 10.03 p. m., local time. Correction for instrumental error of barometer used: From 6.03 a. m., January 1, to 10.03 p. m., December 31, 1884, inclusive, —.007 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.840; February, 0.840; March, 0.820; April, 0.800; May, 0.760; June, 0.760; July, 0.760; August, 0.750; September, 0.770; October, 0.790; November, 0.820; December, 0.880.

WM. H. RAY,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

LEAVENWORTH, KANS.

Location of office on December 31, 1884, No. 315 Delaware street.

[Latitude, 39° 19' N.; longitude, 94° 57' W. Elevation of barometer above sea level, 843 feet. Elevation of exposed thermometer above ground, 35 feet. Elevation of rain gauge above ground, 48 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.				Total movement.		
Washington time.				Monthly mean.			Washington time.			Self-registering thermometer.			Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.							
7 a. m.	8 p. m.	11 p. m.	In.	Highest.	Lowest.	Range.	7 a. m.	8 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Last rest.	Date.	Miles.		Direction from.	Date.
1884.																								
29.341	29.316	29.334	29.330	29.330	4 28.728	9 1.157	16.6	35.8	21.5	21.1	57.0	20	31.0	5	78.0	30.2	12.5	0.97	0.83	37	29	N.	28	S.
29.180	29.153	29.168	29.165	29.165	9 28.498	18 1.072	22.8	32.3	28.7	27.9	57.0	25	1.0	13	58.0	37.8	19.5	1.42	0.44	4	37	NW.	19	NW.
29.098	29.074	29.093	29.088	29.082	14 28.839	27 1.188	34.9	47.9	41.0	41.3	70.0	26	11.0	3	59.0	51.3	32.8	2.70	0.95	81	38	NW.	2	S.
29.066	29.033	29.062	29.054	29.054	3 28.442	26 0.922	44.8	58.0	49.6	49.6	75.8	29	39.0	8	46.8	60.7	42.6	4.74	1.86	19	35	NW.	2	NW.
29.109	29.092	29.102	29.101	29.088	28 28.739	5 0.649	55.6	68.0	60.9	62.0	84.0	9	38.0	2	45.0	72.8	53.0	4.70	1.14	5	24	N.	1	NW.
29.146	29.112	29.120	29.126	29.016	28 28.854	8 0.463	65.6	79.6	70.8	72.1	90.8	24	52.0	10	38.8	83.3	62.8	2.33	1.13	8	34	N.	25	SE.
29.064	29.038	29.049	29.029	29.029	20 28.831	8 0.498	71.1	84.5	76.3	77.3	101.0	8	58.5	10	42.5	88.1	68.0	9.40	4.31	12	18	N.	1	S.
29.178	29.156	29.151	29.162	29.077	9 28.858	28 0.619	66.1	78.8	70.7	71.8	93.0	28	59.0	10	43.0	81.2	64.0	4.03	2.07	24	25	SE.	24	SE.
29.117	29.067	29.088	29.091	29.077	20 28.663	23 0.824	64.4	80.5	70.8	71.7	90.0	3	43.8	25	41.2	81.6	62.7	5.33	1.56	27	29	S.	30	S.
29.245	29.214	29.226	29.232	29.022	28 28.978	26 0.644	52.6	66.0	57.0	57.0	86.0	4	32.0	23	34.0	70.5	48.8	3.41	1.48	30	31	S.	2	S.
29.241	29.207	29.231	29.226	29.010	5 28.669	22 0.921	36.7	51.1	41.6	43.1	68.0	9	10.2	23	57.8	53.1	33.5	1.43	1.11	22	23	NW.	22	S.
29.255	29.211	29.241	29.236	29.764	24 28.661	6 1.103	21.0	38.0	23.4	24.1	60.0	4	4.0	24	60.0	31.9	13.1	1.48	0.36	30	32	NW.	23	N.
330.060	340.858	340.875	340.875	29.880	4 28.839	10.054	552.4	704.0	611.8	622.6	101.0	18	31.0	6	52.5	61.8	44.2	73	0	.....	.....	.....	.....	S.
29.172	29.141	29.156	29.156	29.156	.....	.....	.....	58.7	51.0	51.9	101.0	18	31.0	5	52.5	61.8	43.2	.....	.....	.....	.....	.....	.....	.....

\* January.

† March.

‡ July.

## LEAVENWORTH, KANS.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.			Relative humidity (per cent.).			Cloudiness (in tenths).			Number of days—							River.*															
	Number of calms.								Mean.			Mean.			Mean.			Percentage.																						
									North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.			Fair.	Cloudy.	On which oil inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunderstorms.	Highest.	Date.	Lowest.	Date.	Range.	Mean.	
1884.	20	2	3	4	30	7	7	16	4	9.8	13.3	14.8	12.4	75.8	61.5	74.5	70.6	4.8	5.8	3.5	4.7	7	18	6	10	12	26	0	0	Frozen during entire month.	Ft. In.	Ft. In.	Ft. In.							
Jan...	24	6	0	5	13	5	4	24	6	14.1	17.9	19.7	17.2	69.2	54.8	63.8	64.9	5.8	6.7	4.9	5.8	6	12	11	11	10	25	0	0	5	6	28	5	1	28	0	5	4.2		
Feb...	17	6	6	12	21	4	1	20	6	28.2	30.2	32.0	30.1	76.9	53.8	71.1	67.3	5.9	6.0	5.4	5.8	5	18	8	13	4	12	0	4	16	2	25	5	8	12	3	6	10		
Mar...	14	7	7	15	9	6	3	18	11	38.5	38.8	40.6	39.1	79.0	61.0	71.9	67.3	5.4	7.0	5.7	6.0	5	14	11	17	0	2	0	3	17	11	9	10	8	29	7	8	13.8		
Apr...	9	1	8	15	10	5	3	18	24	47.9	47.3	50.7	48.6	76.2	48.3	70.2	64.9	4.8	5.9	2.8	4.8	4	10	15	6	0	0	0	5	13	5	31	10	2	22	3	3	11	7.8	
May...	6	1	5	14	7	1	0	8	48	60.8	61.2	62.9	61.6	83.9	54.6	76.7	71.7	4.8	5.7	2.4	4.8	1	9	20	1	8	0	0	2	6	17	10	24	25	13	6	1	4	4.15	
June...	12	5	7	10	18	2	1	7	31	64.3	64.1	67.7	64.0	79.6	55.8	75.7	70.4	5.0	4.6	2.4	4.8	4	11	13	2	14	0	0	11	10	17	8	5	6	13	5	28	3	10	14
July...	7	3	6	22	24	2	0	13	16	60.6	62.0	62.5	61.7	82.9	58.9	75.9	72.6	4.8	3.3	2.5	4.2	4	12	14	5	11	0	0	3	8	14	0	1	9	5	18	4	7	10	
Aug...	7	1	5	18	44	1	1	7	6	58.4	59.9	61.1	59.8	81.0	51.7	72.4	68.7	3.7	3.6	2.0	3.1	3	17	9	4	7	0	0	6	10	4	1	7	9	25	2	7	8		
Sept...																																								
Oct...	12	0	4	4	45	3	1	11	13	37.2	43.4	49.1	43.8	82.5	50.6	75.3	68.5	3.3	3.1	2.5	3.0	19	8	4	10	0	0	0	1	9	8	7	7	28	30	2	1	8	6.5	
Nov...	20	2	3	4	29	2	1	13	16	32.2	31.8	34.1	33.7	82.2	58.3	73.4	71.0	3.1	2.9	3.9	3.6	16	8	6	6	1	8	0	0	7	7	1	4	5	0	30	2	7	7	
Dec...	30	3	4	12	14	1	2	23	4	18.4	21.4	18.7	19.5	83.7	77.5	82.5	82.3	7.2	7.3	6.7	7.0	5	12	14	14	16	22	0	0	6	7	8	10	4	8	15	1	10	5	
Sums.	178	37	58	135	264	39	24	178	135	480	550	751.2	498	959	976	839	492	253	464	344	455	7	132	106	78	136	48	95	16	43	Percentage.	Percentage.	Percentage.	Percentage.	Percentage.	Percentage.	Percentage.	Percentage.	Percentage.	
Means	16.23	4.5	3.12	3.24	10.3	2.16	2.16	2.16	40	41.7	42.8	41.5	80.0	58.4	74.1	70.2	4.9	5.4	8.7	4.73	3.45	4.31	3.87	3.11	7.84	0.4	11.7	Percentage.	Percentage.	Percentage.	Percentage.	Percentage.	Percentage.	Percentage.	Percentage.	Percentage.	Percentage.	Percentage.	Percentage.	

\* February, four days only; December, seventeen days.

NOTE.—7 a. m., 3 p. m., and 11 p. m.; Washington time, correspond to 5.48 a. m., 1.48 p. m., and 9.48 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.017 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.960; February, 0.960; March, 0.940; April, 0.910; May, 0.880; June, 0.870; July, 0.890; August, 0.890; September, 0.880; October, 0.900; November, 0.940; December, 0.900.

REMARKS.—Lunar halo on January 4 and 13. Lightning near south horizon February 18. Lunar halo on March 8, 9, and 30. Lunar halo on October 31.

CHARLES DILL,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

LEAVENWORTH, KANS.

Location of office on December 31, 1884, No. 315 Delaware street.

[Latitude, 38° 19' N.; longitude, 94° 57' W. Elevation of barometer above sea level, 843 feet. Elevation of exposed thermometer above ground, 86 feet. Elevation of rain gauge above ground, 48 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.				Wind.												
Month.	Washington time.				Monthly mean.				Washington time.				Self-registering thermometers.				Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.		Total movement.									
	7 p. m.	9 p. m.	11 p. m.	In.	In.	In.	In.	Highest.	Lowest.	Date.	Range.	7 a. m.	9 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.		Date.	Miles.	Direction from—	Date.	Miles.				
1884.																							In.	In.	27	28	N.	28	S.	5,586		
Jan.....	29.341	29.316	29.324	29.330	29.330	4	28.728	9	1.157	18.6	35.3	21.5	31.1	37.0	30	21.0	5	78.0	0	30.2	12.5	30.2	1.97	53	27	28	N.	19	N.	6,021		
Feb.....	29.180	29.153	29.168	29.165	29.165	9	28.408	18	1.072	22.8	32.3	28.7	27.9	37.0	25	1.0	13	58.0	0	13	37.8	18.5	1.42	44	4	27	NW.	19	NW.	6,823		
Mar.....	29.098	29.074	29.093	29.088	29.088	14	28.339	27	1.188	34.9	47.9	41.0	41.3	70.0	28	11.0	3	59.0	0	51.3	32.8	3.70	95	31	88	NW.	3	88	NW.	5,196		
Apr.....	29.066	29.033	29.052	29.054	29.054	8	28.442	26	.922	44.2	53.0	49.6	50.3	75.8	28	8	48.8	0	48.8	60.7	42.6	4.74	136	19	35	NW.	19	35	NW.	4,373		
May.....	29.109	29.092	29.102	29.101	29.088	28	28.739	5	.649	55.6	60.6	60.9	62.0	84.0	9	39.0	2	45.0	10	73.8	53.0	4.70	114	5	24	N.	1	NW.	1	NW.	3,943	
June.....	29.146	29.112	29.120	29.126	29.316	28	28.854	8	.403	65.8	70.8	70.8	72.1	90.8	24	53.0	11	38.8	8	82.2	63.8	2.33	118	8	84	N.	25	84	N.	2,389		
July.....	29.084	29.058	29.049	29.052	29.829	30	28.831	8	.498	71.1	84.5	76.3	77.3	101.0	8	58.5	10	42.5	10	42.5	68.0	0.48	4.43	121	13	25	N.	13	25	N.	3,323	
Aug.....	29.178	29.156	29.151	29.152	29.477	9	28.858	28	.619	66.1	78.6	70.7	71.8	93.0	28	50.0	10	43.0	10	43.0	81.2	62.7	6.05	207	24	15	SE.	14	15	SE.	4,187	
Sept.....	29.117	29.087	29.088	29.091	29.477	9	28.853	28	.824	64.4	80.5	71.7	71.7	90.0	8	48.8	25	41.2	8	41.2	62.7	5.33	156	27	26	SE.	24	26	SE.	5,596		
Oct.....	29.245	29.214	29.236	29.232	29.622	28	28.978	26	.644	53.6	68.6	57.0	58.4	86.0	4	32.0	23	54.0	0	23	70.5	49.1	1.14	148	30	19	S.	3	19	S.	4,373	
Nov.....	29.241	29.207	29.231	29.226	29.610	5	28.699	23	.921	36.7	51.1	41.6	43.1	68.0	9	10.2	23	57.8	0	23	53.1	33.5	1.43	111	23	22	NW.	23	22	NW.	3,943	
Dec.....	29.255	29.211	29.241	29.236	29.764	24	28.661	6	1.103	31.0	23.0	23.4	24.1	60.0	4	-3.0	24	66.0	0	24	63.1	18.1	1.48	96	30	22	NW.	23	22	NW.	4,862	
Sums.....	350.060	349.688	349.875	349.875	349.875	27	28.540	27	10.054	562.4	704.0	611.8	622.6	910.0	19	-31.0	630.1	741.4	518.8	844.72	43.2	43.2	.....	.....	.....	.....	.....	.....	.....	.....	57,847	
Means.....	29.172	29.141	29.156	29.156	29.156	4	28.389	27	.888	44.0	53.7	51.0	51.0	51.0	10	-3.0	53.5	61.8	43.2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

\* January.

† March.

‡ July.

## LEAVENWORTH, KANS.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—							River.*																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	Number of calms.								Washington time.				Clear.				Fair.				Cloudy.				On which 10 inch or more precipitation fell.				Minimum below 32°.				Maximum above 90°.				Thunder-storms.				Highest.				Date.				Lowest.				Date.				Range.				Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.								Ft. In.	Ft. In.	Ft. In.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
1884.																												Ft. In.	Ft. In.	Ft. In.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Jan...	20	2	3	4	30	7	7	16	4	9.8	13.3	14.3	12.4	75.8	61.5	74.5	70.6	4.8	5.8	3.5	4.7	7	18	6	10	12	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Percentages.

Percentages.

\* February, four days only; December, seventeen days.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.48 a. m., 1.48 p. m., and 9.48 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.017 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.940; February, 0.950; March, 0.940; April, 0.910; May, 0.890; June, 0.870; July, 0.890; August, 0.890; September, 0.880; October, 0.900; November, 0.940; December, 0.900.

REMARKS.—Lunar halo on January 4 and 13. Lightning near south horizon February 18. Lunar halo on March 8, 9, and 30. Lunar halo on October 31.

CHARLES DILL,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

LEWISTON, IDAHO.

Location of office on December 31, 1884, corner Montgomery and Fourth streets.

[Latitude, 46° 8' N.; longitude, 117° 5' W. Elevation of barometer above sea-level, 780 (B) feet. Elevation of exposed thermometer above ground, 22 feet. Elevation of rain-gauge above ground, 36 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.		Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	Washington time.			Monthly mean.			Date.			Range.			Washington time.			Self-registering ther- mometers.			Mean maximum.			Mean minimum.		Any 3 con- secutive 8 hourly measure- ments.		Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
	7 p. m.	8 p. m.	11 p. m.	In.	Th.	In.	Date.	Lowest.	Date.	Range.	7 p. m.	8 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Date.		Miles.	Direction from—	Date.	Total amount.	In.	Th.	Miles.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							

§ February.

† August.

‡ March.

\* January.

## LEWISTON, IDAHO—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—						Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—																
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Washington time.				Clear.				Rain.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.					
									7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.									7 a. m.	3 p. m.	11 p. m.	Mean.	
1884.																													
Jan.....	0	19	0	1	0	4	0	2	20.9	23.4	24.7	23.0	71.5	72.2	73.8	70.0	5.5	4.9	0	0	0	0	0	0	0				
Feb.....	0	13	4	18	0	8	0	4	14.8	22.1	19.6	18.8	72.2	73.5	75.9	73.9	5.3	4.7	0	0	0	0	0	0	0				
Mar.....	0	9	14	30	0	10	3	9	30.0	32.8	35.0	32.6	74.8	77.5	72.8	68.2	4.4	4.0	0	0	0	0	0	0	0				
Apr.....	0	83	0	23	0	3	0	7	37.7	40.6	41.8	40.0	77.5	80.9	63.6	64.0	4.5	3.3	0	0	0	0	0	0	0				
May.....	0	15	0	15	0	3	0	7	45.3	42.9	46.6	44.9	79.9	86.0	51.7	55.9	2.9	2.8	0	0	0	0	0	0	0				
June.....	0	29	0	12	0	4	0	10	54.9	55.6	58.4	52.3	83.6	84.1	64.5	58.3	4.7	4.7	0	0	0	0	0	0	0				
July.....	0	20	0	12	0	5	0	9	53.5	49.9	53.4	52.3	79.1	80.2	54.0	58.3	3.0	3.2	0	0	0	0	0	0	0				
Aug.....	1	18	0	12	0	5	0	9	50.3	47.5	48.1	48.6	70.2	73.9	56.8	45.6	1.2	1.7	0	0	0	0	0	0	0				
Sept.....	2	25	0	13	0	10	0	13	41.9	43.6	43.8	42.8	77.1	80.4	59.5	62.3	4.3	4.2	0	0	0	0	0	0	0				
Oct.....	2	20	1	14	0	10	0	8	39.7	41.3	42.8	41.5	83.7	84.1	79.1	83.7	4.1	4.2	0	0	0	0	0	0	0				
Nov.....	0	5	1	1	0	2	1	2	31.3	37.1	38.7	34.7	85.5	87.0	87.0	83.0	4.2	3.7	0	0	0	0	0	0	0				
Dec.....	0	1	0	0	0	0	0	8	11.0	15.0	13.5	13.2	79.6	77.1	82.5	79.7	6.4	6.0	0	0	0	0	0	0	0				
Sums ..	6	207	14	78	1	69	20	91	431.3	451.8	461.3	448.0	934.7	869.0	802.1	802.0	49.9	54.2	46.0	27	7	27	7	2	2				
Means ..	Percentages.						Percentages.						Percentages.						Percentages.										
	0.518	9	1.3	7.1	0.1	0.3	1.8	8.3	35.7	37.6	38.4	37.3	77.9	55.8	68.2	66.8	4.2	4.5	3.8	4.2	40.4	41.8	18.3	31.1	10.4	26.5	7.4	1.9	0.5

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.20 a. m., 12.20 p. m., and 8.20 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m. January 1, to 11 p. m., December 31, 1884, inclusive, +.004 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.870; February, 0.870; March, 0.880; April, 0.880; May, 0.840; June, 0.820; July, 0.810; August, 0.810; September, 0.830; October, 0.850; November, 0.870; December, 0.880.

C. E. BUTLER,  
Private, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

LITTLE ROCK, ARK.

Location of office on December 31, 1884, Standard Bank Building.

[Latitude, 34° 45' N.; longitude, 92° 0' W. Elevation of barometer above sea-level, 299 feet. Elevation of exposed thermometer above ground, 26 feet. Elevation of rain-gauge above ground, 58 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.			Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	Washington time.				Monthly mean.		Highest.		Lowest.		Range.		Washington time.				Self-registering thermometers.				Mean maximum.			Mean minimum.		Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	7 p. m.		8 p. m.		11 p. m.		Date.	Date.	Lowest.	Date.	Range.	Date.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.		Last 3 days amount.	Date.	Miles.	Direction from —	Date.	Miles.	Direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	In.	7 p. m.	In.	7 p. m.	In.	7 p. m.																									In.	7 p. m.	In.	7 p. m.	In.	7 p. m.	In.	7 p. m.	In.	7 p. m.	In.	7 p. m.	In.	7 p. m.	In.	7 p. m.	In.	7 p. m.	In.	7 p. m.	In.	7 p. m.	In.	7 p. m.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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\* January.

† April.

‡ July.



## LITTLE ROCK, ARK.—Continued.

Month.	Winds at 7 a. m. and 11 p. m. Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								River.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
	Washington time.									Mean.				Mean.				Mean.				On which .01 inch or more precipitation fell. Maximum below 32°. Minimum below 32°. Maximum above 90°. Thunder-storms.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Auroras.	Highest.	Date.	Lowest.	Date.	Range.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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Percentages.

† November.

\* February.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6 a. m., 2 p. m., and 10 p. m., local time.

Corrections for instrumental error of barometer used: From 6 a. m., January 1, to 10 p. m., September 30, inclusive, —0.13 inch; from 6 a. m., October 1, to 10 p. m., December 31, 1884, inclusive, —0.17 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.389; February, 0.389; March, 0.389; April, 0.320; May, 0.310; June, 0.310; July, 0.310; August, 0.326; September, 0.310; October, 0.326; November, 0.330; December, 0.330.

REMARKS.—First frost of autumn, October 24; last frost of spring, April 6; April 1, barometer raised 10 inches.

W. U. SIMONS.

Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884 - Continued.*

LOS ANGELES, CAL.

Location of office on December 31, 1884, Baker Block, No. 242 Main street.

[Latitude 34° 8' N.; longitude, 118° 15' W. Elevation of barometer above sea-level, 371 feet. Elevation of exposed thermometer above ground, 57 feet. Elevation of rain-gauge above ground, 107 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.				Wind.			Total movement.			
	Washington time.			Monthly mean.			Self-registering thermometers.				Any consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.												
	Washington time.			Monthly mean.			Self-registering thermometers.				Any consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.												
	7 a. m.	3 p. m.	11 p. m.	Date.	Lowest.	Highest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Latest amount.	Date.	Miles.	Direction from—		Date.		
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.		
Jan.....	29.741	29.752	29.742	29.745	30.005	1.29.449	25	.646	46.9	62.9	52.0	53.9	78.0	12	33.7	17	44.3	64.4	42.9	3.15	1.38	27, 28	24	{SW., } E. }	NE.	5, 166	
Feb.....	29.633	29.671	29.676	29.653	29.880	19.29.183	6	.897	49.7	61.8	53.8	55.1	81.0	24	38.5	9	42.5	63.7	47.1	13.87	3.63	1, 2	40	W.	NE.	5, 488	
Mar.....	29.613	29.655	29.633	29.634	29.818	8.29.451	8	.367	48.9	61.7	53.8	54.8	72.5	1	37.0	27	35.5	63.5	47.4	12.36	3.18	8, 4	30	NW.	NE.	5, 681	
Apr.....	29.627	29.647	29.627	29.634	29.836	1.29.405	27	.431	50.4	66.0	55.3	57.2	80.0	20	41.5	1	38.5	68.4	49.1	3.58	2.20	9, 10	24	{SW., } W. }	W.	4, 513	
May.....	29.614	29.614	29.606	29.611	29.730	10.29.466	18	.264	55.4	70.6	58.9	61.6	79.0	28	47.0	2	32.0	72.7	54.3	.39	.22	19, 20	18	W.	W.	4, 026	
June.....	29.556	29.585	29.565	29.569	29.721	14.29.398	25	.323	58.0	75.3	63.4	65.6	98.0	30	49.5	14	48.5	78.1	57.0	1.89	.87	12, 13	20	{S., } W. }	W.	3, 853	
July.....	29.570	29.587	29.563	29.573	29.697	18.29.451	1	.246	59.7	84.5	66.3	70.2	99.0	1	51.5	16	47.5	86.9	58.6	.02	.01	3, 30	18	W.	W.	3, 164	
Aug.....	29.548	29.561	29.543	29.551	29.698	4.29.456	6	.242	61.8	84.7	67.4	71.3	101.5	29	52.5	28	49.0	87.0	60.0	.02	.01	26, 28	20	W.	W.	3, 685	
Sept.....	29.560	29.576	29.553	29.563	29.710	15.29.327	29	.383	56.7	77.1	62.6	65.5	92.5	21	45.5	17	47.0	79.9	54.1	5.17	1.87	5, 17	18	NW.	W.	3, 583	
Oct.....	29.592	29.606	29.599	29.599	29.788	27.29.306	1	.482	54.1	72.6	63.1	62.3	89.1	22	42.9	7	46.2	74.3	51.2	.39	.17	12, 13	24	{NW., } SW. }	W.	3, 707	
Nov.....	29.664	29.662	29.662	29.663	29.779	24.29.437	21	.312	51.2	70.7	56.9	59.6	88.0	7	38.7	27	49.3	73.2	48.0	1.07	1.01	12, 13	14	{SW., } W. }	W.	3, 284	
Dec.....	29.615	29.621	29.619	29.618	29.904	31.29.236	12	.668	46.8	58.9	51.1	52.3	75.6	1	35.5	2	40.1	61.4	44.2	4.65	3.04	25, 26	34	NE.	NE.	4, 335	
Suma.....	295.333	295.557	295.355	295.368	355.413			5.091	639.6	846.8	701.6	728.4				520.4	873.5	613.9	40.39							50, 439	
Means.....	29.641	29.638	29.614	29.618	30.096	1.29.183	96	.424	53.0	70.6	58.5	60.8	101.5	129	33.7	17	43.4	72.8	51.2							W.	.....

• (—) Dash indicates precipitation inappreciable.

† One 7 a. m. observation missed.

‡ January.

§ February.

|| August.

\* (—) Dash indicates precipitation inappreciable.

† One 7 a. m. observation missed.

‡ January.

§ February.

|| August.

## LOS ANGELES, CAL.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.			Relative humidity (per cent.).			Cloudiness (in tenths).			Number of days—													
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Washington time.			Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 82°.	Minimum below 82°.	Maximum above 80°.	Thunder-storms.	Auroras.		
										7 a. m.	3 p. m.	11 p. m.																				
1884.																																
Jan.....	9	27	18	6	7	8	9	4	35.2	38.2	41.7	38.4	67.9	47.0	70.7	61.9	3.2	4.4	3.0	3.5	17	8	9	5	0	0	0	0	0	0	0	
Feb.....	7	20	21	7	7	4	11	2	44.3	43.9	45.8	44.0	78.4	57.8	77.0	71.1	5.1	3.9	2.9	3.5	11	9	10	14	0	0	0	0	0	0	0	
Mar.....	7	20	13	4	14	14	16	3	47.0	47.0	48.0	46.4	84.7	61.6	81.6	76.0	5.4	7.0	3.2	5.9	9	11	11	18	0	0	0	0	0	0	0	
Apr.....	0	16	11	2	12	24	43	0	51.7	51.6	51.0	50.1	90.6	62.2	85.4	79.4	4.9	5.8	2.9	4.5	11	13	6	9	0	0	0	0	0	0	0	0
May.....	0	16	3	3	14	18	43	1	54.2	55.2	53.4	53.3	87.9	59.0	81.5	76.1	5.6	6.1	2.6	5.1	7	16	8	4	0	0	0	0	0	0	0	0
June.....	0	10	4	0	5	19	66	1	56.6	61.7	60.1	59.5	89.5	47.1	80.6	72.6	2.5	2.2	.6	1.1	94	7	0	0	0	0	0	0	0	0	0	0
July.....	0	10	1	2	1	16	47	0	57.5	62.8	61.1	60.5	87.0	49.0	81.8	72.6	1.7	1.4	.6	1.2	23	8	0	0	0	0	0	0	0	0	0	0
Aug.....	1	13	2	0	4	16	49	0	50.9	57.0	57.4	55.1	82.2	52.0	83.4	72.5	2.7	3.0	1.5	2.4	30	8	2	0	0	0	0	0	0	0	0	0
Sept.....	2	14	1	1	7	16	41	1	48.3	51.7	53.3	51.1	83.2	51.3	80.8	71.8	1.1	1.9	1.0	1.3	35	4	2	2	0	0	0	0	0	0	0	0
Oct.....	5	19	0	1	7	11	35	3	44.9	49.5	50.8	48.4	81.4	50.9	81.2	71.2	2.3	2.0	2.0	1.4	13	11	6	3	0	0	0	0	0	0	0	0
Nov.....	1	25	6	8	6	7	28	4	42.3	45.2	45.7	44.4	85.3	63.5	82.7	77.2	3.0	3.0	2.8	3.8	13	11	6	10	0	0	0	0	0	0	0	0
Dec.....	2	27	14	9	6	1	16	7	42.3	45.2	45.7	44.4	85.3	63.5	82.7	77.2	3.0	3.0	2.8	3.8	13	11	6	10	0	0	0	0	0	0	0	0
Sums ..	24	211	94	41	82	132	385	47	576.0	632.2	625.4	607.9	1005.7	659.1	948.1	877.7	44.4	47.9	32.4	41.5	189	110	66	71	0	0	15	5	0	0	0	0
Means .	Percentages.								Percentages.								Percentages.								Percentages.							
	2	219.2	8.6	3.7	7.5	12	0.85	1	4.3	7.4	48.0	51.8	52.1	50.6	83.8	54.9	80.7	73.1	3.7	4.0	2.7	3.5	51.8	30.1	18.1	19.4	0	0	4.1	1.4	0	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.15 a. m., 12.15 p. m., and 8.15 p. m., local time. Correction for instrumental error of barometer used: From 4.50 a. m., January 1, to 8.15 p. m., December 31, 1884, inclusive, +.011 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.400; February, 0.400; March, 0.400; April, 0.400; May, 0.400; June, 0.390; July, 0.390; August, 0.390; September, 0.390; October, 0.400; November, 0.400; December, 0.400.

REMARKS.—January 4, slight shock of earthquake felt; heavy frosts during month. February 6, hail fell; solar halo on 26th and 27th; frosts on 8th, 9th, and 13th. March 21, solar halo; lunar halo, 12th; frosts on 11th, 24th, 25th, and 27th. April 1, 4, and 5, lunar halos. Frequent fogs during month of May. June 16, slight shock of earthquake felt. July 27, polar bands; remarkably red appearance of sky after sunset noted during month. August 2, 3, and 15, polar bands; red sunsets noted during month. September, remarkably brilliant red sunsets observed during the month. October 22, slight shock of earthquake; lunar halo, 28th; red sunsets during month. November 4, lunar halo; red sunsets noted frequently during month. December 2, first frost of the season; frost on 3d, 6th, 13th, 14th, 15th, 16th, and 17th; red sunsets noted during the month; lunar corona 31st.

GEORGE E. FRANKLIN,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

**LOUISVILLE, KY.**

**Location of office on December 31, 1884, corner Fourth and Green streets.**

[Latitude, 29° 19' N.; longitude, 85° 49' W. Elevation of barometer above sea-level, 530 feet. Elevation of exposed thermometer above ground, 89 feet. Elevation of rain-gauge above ground, 102 feet.]

[illegible]

**Thirty and two-third days.**

**January.**

**i April**

**6 June.**

## LOUISVILLE, KY.—Continued.

Month.	Dew-point.										Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—						River.																											
	Winds at 7 a. m., 3 and 11 p. m., Washington time; Number of times observed blowing from—										Washington time.		Mean.		7 a. m.		3 p. m.		11 p. m.		Mean.		Clear.		Fair.		Cloudy.		On which 0.1 inch or more precipitation fell.		Minimum below 32°.		Maximum above 80°.		Thunder-storms.		Highest.		Date.		Lowest.		Date.		Range.		Mean.	
1884.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which 0.1 inch or more precipitation fell.	Minimum below 32°.	Maximum above 80°.	Thunder-storms.	Highest.	Date.	Lowest.	Date.	Range.	Mean.														
Jan ...	14	9	2	11	16	20	13	8	0	18.6	21.2	19.6	20.5	77.4	73.7	75.6	74.5	6.8	7.1	4.8	6.2	6	13	12	12	14	24	0	1	19	10	13	12	10	6.6													
Feb ...	12	5	4	9	15	14	16	8	4	21.6	36.8	34.8	34.7	76.0	70.5	76.9	74.5	7.1	7.4	5.6	6.7	5	9	15	15	2	9	0	1	36	7	15	16	10	20	35	9	32	11.2									
Mar ...	9	10	9	13	10	11	20	8	3	31.1	33.0	34.6	35.2	74.7	56.4	68.3	66.5	7.0	7.0	6.9	6.9	3	12	16	13	0	0	0	1	25	10	14	8	6	6	7	17	4	16	5								
Apr ...	8	18	5	13	4	10	22	7	3	40.0	41.3	42.5	41.3	71.3	52.8	66.0	63.4	6.5	7.3	4.7	6.2	7	8	15	13	0	0	0	3	11	8	1	7	7	19	4	19	8.6										
May ...	12	11	7	9	20	11	7	6	4	5.0	58.6	58.1	57.2	81.3	63.1	61.2	73.2	4.8	5.6	7.6	4.3	10	16	5	13	0	0	0	7	9	5	1	6	10	31	2	7	8	1.9									
June ...	15	11	3	5	19	7	6	5	10	63.7	66.6	67.0	65.8	80.9	63.9	63.0	76.6	6.5	7.9	6.2	6.5	4	14	12	12	0	0	5	7	7	3	20	5	2	30	2	2	6	2									
July ...	21	1	3	5	15	20	15	10	3	63.7	66.2	67.6	66.5	81.4	59.5	79.0	73.2	5.4	6.3	3.6	6.1	5	20	6	12	0	0	4	7	7	0	2	3	28	3	10	5	0.6										
Aug ...	13	10	3	9	19	14	9	7	9	61.9	61.7	61.9	62.8	80.2	50.7	74.9	68.6	2.7	5.5	2.1	3.4	15	13	3	6	0	0	4	10	3	5	1	2	7	24	0	10	21.4										
Sept ...	18	10	4	11	16	13	6	6	5	61.8	61.7	61.9	62.8	80.2	50.7	74.9	68.6	2.7	5.5	2.1	3.4	15	13	3	6	0	0	4	10	3	5	1	2	7	24	0	10	21.4										
Oct ...	9	6	1	13	19	12	11	10	9	52.1	51.9	54.8	53.9	73.9	57.7	78.6	73.5	3.6	3.8	1.8	3.1	11	15	2	7	0	0	1	3	11	3	4	2	7	9	12	15	1	4	3	0							
Nov ...	9	6	1	13	19	12	11	10	9	37.0	39.4	33.0	38.5	79.4	61.0	73.0	71.2	3.4	5.1	4.2	4.2	13	9	6	6	0	0	0	3	11	11	12	2	9	8	9	1	2	3	3.3								
Dec ...	16	7	8	15	9	14	12	10	2	30.0	31.3	30.7	30.7	79.8	73.0	77.9	76.9	8.1	7.6	6.6	7.4	7	3	21	16	6	12	0	0	9	5	30	3	3	1	3	6	2	6	1								
Sums	155	106	54	134	163	160	145	93	64	532	557.9	580.7	571.0	948.8	7743.1	914.4	868.9	87.3	76.4	51.7	65.0	101	142	1	3	130	23	57	20	46	.....	.....	91	1	108	2	6											
Percentages.																																																
Means	14.1	9.6	5.3	12.2	16.7	14.6	13.2	8.5	5.8	46.0	48.3	48.4	47.6	79.1	61.9	76.2	72.4	5.6	6.4	4.3	5.4	427	638	833	635.5	6.3	15.6	2	7	15	10	2	7	19	11	7	7.1	9	0.2									

† September.

† October.

\* February.

NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond to 6.25 a. m., 2.25 p. m., and 10.25 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive,  $\pm .020$  inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.590; February, 0.590; March, 0.590; April, 0.570; May, 0.560; June, 0.560; July, 0.560; August, 0.550; September, 0.540; October, 0.570; November, 0.590; December, 0.600.

REMARKS.—January 5 coldest day recorded at station; minimum,  $-19^{\circ} 5$ . February 15 and 16 river reached 40 feet 7 inches, this being the highest water ever observed at this point. River above danger line from February 4, 9.22 p. m., to February 25, 1.25 p. m.

E. H. GARRITT,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

LYNCHBURG, VA.

Location of office on December 31, 1884, First National Bank Building.

[Latitude, 37° 29' N.; longitude, 79° 9' W. Elevation of barometer above sea-level, 653 feet. Elevation of exposed thermometer above ground, 30 feet. Elevation of rain-gauge above ground, 50 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
	Washington time.					Monthly mean.					Highest.					Lowest.					Date.					Range.					7 a. m.					8 p. m.					11 p. m.					Monthly mean.					Maximum.					Date.					Minimum.					Absolute range.					Mean maximum.					Mean minimum.					Total amount.					Largest amount.					Any 3 consecutive 8-hourly measurements.					Maximum hourly velocity during month.					Direction from—					Prevailing direction.					Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	7 p. m.		3 p. m.		11 p. m.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.		Fa.		In.</	

\* One 11 p. m. observation missed.

† January.

‡ April.

§ July.

## LYNCHBURG, VA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.	Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—																																											
	Number of calms.									Mean.				Mean.				Mean.				Fair.					Cloudy.					On which precipitation fell.					Maximum below 82°.					Minimum below 82°.					Maximum above 90°.					Thunder-storms.					Aurora.				
North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which precipitation fell.	Maximum below 82°.	Minimum below 82°.	Maximum above 90°.	Thunder-storms.	Aurora.																																	
1884.	Jan.....	0	12	8	7	11	21	8	15	11	21.2	19.1	22.4	20.9	70.6	46.6	67.5	62.5	6.8	6.0	4.7	5.8	2	24	0	0	0	0	0																																
	Feb.....	3	16	9	3	1	11	9	11	10	34.8	32.4	34.4	33.9	77.6	51.8	69.9	66.4	6.4	6.7	5.4	6.2	3	10	0	0	0	0	0																																
	Mar.....	2	13	5	3	16	8	12	23	11	33.7	35.6	36.3	35.2	72.9	52.0	70.2	65.0	6.6	6.0	5.4	6.0	6	18	0	0	0	0	0																																
	Apr.....	1	17	3	3	6	7	14	23	16	40.3	44.1	42.4	42.3	73.8	54.2	71.6	66.5	5.9	6.4	5.0	5.8	5	17	0	0	0	0	0																																
	May.....	3	6	4	6	29	11	13	9	12	54.7	59.0	57.2	57.0	78.2	54.5	78.9	71.2	4.2	5.9	4.4	4.8	11	12	8	9	0	0	0																																
	June.....	7	15	9	9	15	6	2	6	20	62.6	65.6	64.3	64.2	85.5	65.5	85.5	73.8	6.0	6.1	5.6	5.9	4	11	12	8	9	0	0																																
	July.....	5	5	3	1	9	24	13	12	21	62.5	60.7	65.0	62.4	72.8	45.9	74.4	64.4	4.0	5.1	3.9	4.3	3	10	17	4	13	0	0																																
	Aug.....	4	19	12	3	4	5	5	15	26	62.7	60.7	65.0	62.8	79.7	47.5	80.6	69.3	4.9	6.3	3.3	4.8	6	18	5	2	10	0	0																																
	Sept.....	1	13	5	7	16	7	8	6	32	57.2	59.4	59.4	56.8	76.9	38.0	73.5	62.8	3.6	4.1	2.6	3.4	15	13	2	2	0	0	0																																
	Oct.....	0	12	6	5	14	9	9	11	27	47.7	45.7	49.8	47.7	77.0	40.9	71.3	63.1	3.2	4.0	3.6	3.6	7	8	0	0	0	0	0																																
	Nov.....	3	8	6	4	13	12	14	17	13	31.0	32.0	33.6	32.2	74.5	45.8	70.0	63.5	2.7	4.0	3.7	3.8	16	7	7	6	0	0	0																																
	Dec.....	3	27	3	0	16	16	12	6	10	23.9	24.9	32.5	32.4	80.9	66.6	73.2	75.6	6.4	6.5	6.2	6.4	4	14	13	10	2	13	0																																
	Sums....	22	163	70	49	169	137	114	154	209	538.3	543.5	561.5	547.8	920.5	614.3	892.6	809.2	61.8	67.2	53.8	60.8	114	147	104	128	5	58	16	21	0																														
	Means....	Percentages.																	Percentages.																																										
		2.9 14.9 6.4 4.5 15.5 12.5 10.4 14.4 19.1																	31.2 40.3 23.5 35.0 1.4 15.9 4.4 5.7 0.0 4.4 5.7 0.0																																										

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.52 a. m., 2.52 p. m., and 10.52 p. m., local time. Correction for instrumental error of barometer used: From 6.52 a. m., January 1, to 10.52 p. m., December 31, 1884, inclusive, +.012 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.720; February, 0.720; March, 0.720; April, 0.710; May, 0.680; June, 0.670; July, 0.670; August, 0.670; September, 0.680; October, 0.690; November, 0.720; December, 0.780.

REMARKS.—Last frost of season, April 12; polar bands observed p. m., May 20; a brilliant meteor observed at 9.04 p. m., June 23; first light frost of season, October 16; first killing frost and ice, October 24; first snow of season, November 30.

JNO. HEALY  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

LYNCHBURG, VA.

Location of office on December 31, 1884, First National Bank Building.

[Latitude, 37° 29' N.; longitude, 79° 9' W. Elevation of barometer above sea-level, 632 feet. Elevation of exposed thermometer above ground, 30 feet. Elevation of rain-gauge above ground, 50 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).						Temperature.						Precipitation.		Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	Washington time.			Monthly mean.			Washington time.			Self-registering ther- mometers.			Any 3-con- secutive 8-hourly measure- ments.		Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	Date.			Date.			Date.			Date.			Date.		Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.		Date.	Miles.	Direction from—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.

\* One 11 p. m. observation missed.

† January.

‡ April.

§ July.



## LYNCHBURG, VA.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m. Washington time: Number of times observed blowing from—						Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).					Number of days—												
	Number of calms.						7 a. m.		8 p. m.		11 p. m.		Mean.		Washington time.					Clear.	Fair.	Cloudy.	On which, 0.1 inch or more precipitation fell.	Maximum below 82°.	Minimum below 82°.	Maximum above 80°.	Thunder-storms.	Aurora.
1884.																												
Jan.	0	12	6	8	7	11	21	19	0	20.9	70.6	49.6	67.5	62.6	6.4	6.4	6.0	6.0	9	14	12	2	24	0	0	0	0	0
Feb.	2	16	6	8	12	11	33	35	34	32.9	77.6	51.8	69.9	66.4	6.4	6.4	6.0	6.0	9	13	18	1	10	0	0	0	0	0
Mar.	2	13	5	8	12	23	11	23	38	35.2	72.9	52.6	70.2	65.0	6.6	6.6	6.0	6.0	6	13	17	0	6	0	0	0	0	0
Apr.	1	17	3	6	7	14	23	44	42	42.3	73.8	54.2	71.6	66.5	5.9	6.4	6.0	5.8	5	17	8	0	0	0	0	0	0	0
May	8	6	4	6	29	11	13	9	12	57.0	78.2	54.5	78.9	71.2	4.2	5.9	4.4	4.8	11	12	8	0	0	0	0	0	0	0
June	7	15	9	15	6	2	6	20	62	64.2	85.5	63.5	83.5	78.8	6.0	6.1	5.6	5.9	7	10	12	0	0	0	0	0	0	0
July	6	5	8	1	9	24	13	21	63	60.5	70.7	47.5	80.6	69.3	4.0	5.1	3.9	4.3	10	17	4	0	0	0	0	0	0	0
Aug.	4	19	12	3	4	5	15	26	62	62.7	76.9	59.4	73.5	62.8	4.9	6.3	3.8	4.8	18	5	10	0	0	0	0	0	0	0
Sept.	1	13	5	7	16	7	8	32	57	53.9	77.0	40.9	71.3	63.1	3.2	4.1	3.6	3.4	15	13	2	0	0	0	0	0	0	0
Oct.	0	12	6	5	14	9	11	27	47	45.7	77.0	40.9	71.3	63.1	3.2	4.1	3.6	3.4	17	8	6	0	0	0	0	0	0	0
Nov.	8	8	6	4	13	12	14	17	31	32.0	74.6	45.8	70.0	63.5	2.7	4.0	3.7	3.8	16	7	7	6	0	0	0	0	0	0
Dec.	3	27	3	0	16	12	6	10	29	34.9	80.9	66.6	73.2	73.6	6.4	6.4	6.2	6.4	4	14	13	2	13	0	0	0	0	0
Sums...	22	168	70	49	169	137	114	154	209	538.3	543.5	561.5	592.6	599.2	61.8	67.2	53.8	60.8	114	147	104	58	16	21	0	0	0	0
Percentages.																												
2.9/14.9 6.4 4.5/15.4 12.5/10.4 14.0/19.1 31.2 40.3 23.5 35.0 1.4 15.8 4.4 5.7 0.0																												
Means.																												

NOTE.—7 a. m., 8 and 11 p. m., Washington time, correspond to 6.52 a. m., 2.52 p. m., and 10.52 p. m., local time.

Correction for instrumental error of barometer used: From 6.52 a. m., January 1, to 10.52 p. m., December 31, 1884, inclusive, +0.12 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.720; February, 0.729; March, 0.720; April, 0.710; May, 0.680; June, 0.670; July, 0.670; August, 0.670; September, 0.680; October, 0.690; November, 0.720; December, 0.730.

REMARKS.—Last frost of season, April 12; polar bands observed p. m., May 29; a brilliant meteor observed at 9.04 p. m., June 23; first light frost of season, October 16; first killing frost and ice, October 24; first snow of season, November 30.

JNO. HEALY,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

MACKINAW CITY, MICH.

Location of office on December 31, 1884, corner Huron avenue and E street.

[Latitude, 45° 47' N.; longitude, 84° 38' W. Elevation of barometer above sea-level, 605 feet. Elevation of exposed thermometer above ground, 20 feet. Elevation of rain-gauge above ground, 84 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.			Wind.			Total movement.										
Washington time.				Monthly mean.		Highest.		Lowest.		Range.		Washington time.				Self-registering thermometers.				Mean maximum.			Mean minimum.		Any 3 consecutive 8-hourly measure ments.		Maximum hourly velocity during month.			Prevailing direction.		
7 P. M.	3 P. M.	11 P. M.		In.	In.	Date.	In.	Date.	In.	In.	Date.	Lowest.	Date.	In.	11 P. M.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.		Mean maximum.	Mean minimum.	Total amount.	Last 3 days.	Date.	Miles.	Direction.		Date.	
1884.																																
Jan.	29.382	29.354	29.384	29.373	30.033	29.638	30.1	29.535	11.1	18.6	13.1	12.6	30.8	17.1	15.9	24.5	55.7	20.9	24.5	20.9	24.5	20.9	4.2	8.09	1.75	30.31	36	SW.	17	W.	7,420	
Feb.	29.371	29.363	29.363	29.365	29.933	29.714	10.1	29.538	9.1	14.0	12.3	12.3	29.0	19.1	16.6	23.5	53.6	19.1	23.5	19.1	23.5	19.1	2.6	5.10	.76	22.29	36	N.W.	19	E.	5,338	
Mar.	29.374	29.349	29.361	29.361	29.820	29.571	11.1	29.249	17.0	29.1	22.6	23.0	52.2	11.1	20.2	2.2	72.4	31.6	2.2	31.6	2.2	31.6	12.6	1.31	.87	22.23	40	SW.	12	W.	6,431	
Apr.	29.343	29.307	29.315	29.322	29.936	29.634	15.1	29.302	23.5	42.7	35.8	37.3	66.1	27.1	19.1	6.1	47.0	44.0	27.1	44.0	27.1	44.0	29.4	.96	.60	15.16	28	SE.	15	W.	6,604	
May	29.270	29.261	29.275	29.268	29.718	29.578	19.1	.840	44.8	63.3	46.0	47.7	72.0	31.1	33.0	2.3	40.0	55.2	31.1	40.0	31.1	55.2	40.2	1.67	.55	13.30	153	N.W.	28	W.	5,886	
June	29.447	29.420	29.410	29.426	29.942	29.106	24.1	.834	53.7	65.9	58.1	60.9	81.4	29.1	43.5	15.3	37.9	60.5	43.5	60.5	43.5	81.4	62.6	2.20	1.07	22.23	32	E.	25	E.	4,789	
July	29.230	29.221	29.233	29.228	29.496	29.818	5.1	.668	50.5	65.9	58.5	61.3	77.8	22.1	47.3	17.1	30.5	68.4	47.3	68.4	47.3	77.8	63.7	2.51	.73	4.26	5	SW.	5	N.W.	6,265	
Aug.	29.317	29.311	29.335	29.338	29.748	29.958	29.1	.790	59.8	66.9	60.0	62.2	80.4	20.1	41.8	8.1	47.6	69.9	41.8	69.9	41.8	80.4	64.2	3.28	1.10	29.30	25	W.	3	N.W.	6,000	
Sept.	29.324	29.303	29.327	29.319	29.822	29.632	24.1	1.260	57.8	65.4	58.5	60.9	88.9	10.1	41.7	23.4	60.2	52.9	41.7	60.2	41.7	88.9	64.2	3.52	1.94	28.32	36	SW.	16	E.	7,016	
Oct.	29.401	29.381	29.376	29.381	29.925	29.571	6.1	.954	46.0	62.3	48.2	48.8	72.0	8.1	27.7	25.1	51.3	55.6	27.7	51.3	27.7	72.0	61.9	3.65	1.01	2.36	36	N.W.	20	N.W.	9,246	
Nov.	29.330	29.310	29.340	29.327	29.606	29.401	23.1	1.095	32.4	56.9	33.6	34.3	57.1	9.1	12.0	24.1	43.1	40.1	12.0	43.1	12.0	57.1	48.5	2.85	1.08	22.23	34	N.W.	23	N.W.	8,730	
Dec.	29.334	29.341	29.368	29.348	29.952	29.661	6.1	1.291	24.5	26.4	24.5	25.1	47.6	29.1	5.0	14.5	52.6	29.1	5.0	14.5	29.1	52.6	29.7	10.1	6.48	1.03	7.8	44	E.	22	N.W.	8,911
Sums	352.153	351.926	352.092	352.086	352.086	352.086	28	12.916	454.2	538.4	471.4	457.9	471.4	39.2	47.8	44.9	471.4	532.8	39.2	47.8	39.2	532.8	239.1	940.32	.....	.....	.....	.....	.....	.....	82,946	
Means	29.346	29.347	29.341	29.338	29.033	29.571	11.1	1.076	57.8	65.4	58.2	60.7	80.4	19.0	43.2	14.5	48.6	60.5	43.2	60.5	43.2	80.4	64.2	3.27	1.10	.....	.....	.....	.....	.....	N.W.	

\* January.

† March.

‡ August.

§ March.

**MACKINAW CITY, MICH.—Continued.**

[illegible]

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.30 a. m., 2.30 p. m., and 10.30 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.008 inch. The barometric observations may be reduced to sea level by adding the following constants for the various months: January 0 April, 0.680; May, 0.650; June, 0.640; July, 0.640; August, 0.640; September, 0.650; October, 0.670; November, 0.690; December, 0.700.

**D. B. NOTSON,**  
*Sergeant, Signal Corps, U. S.*

*Meteorological summary for the year ending December 31, 1884—Continued.*

MACON, FORT, N. C.

Location of office on December 31, 1884, Hospital Building.

[Latitude, 34° 49' N.; longitude, 79° 40' W. Elevation of barometer above sea-level, 11 feet. Elevation of exposed thermometer above ground, 23 feet. Elevation of rain-gauge above ground, 5 feet.]

Barometer readings (corrected for temperature and instrumental error only).														Temperature.						Precipitation.				Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
Washington time.						Month v mean.								Washington time.						Self-registering ther- mometers.				Mean maximum.				Mean minimum.				Total amount.				Any 3 con- secutive 8 hourly measure- ments.				Maximum hourly velocity during month.				Prevailing direction.				Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
7 p. m.			3 p. m.			11 p. m.			Range.			Date.			Lowest.			Highest.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.			Date.		

• January.

† April.

‡ July.

**MACON, FORT, N. C.—Continued.**

[illegible]

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.02 a. m., 3.02 p. m., and 11.02 p. m., local time. Correction for instrumental error of barometer used: From 7.02 a. m., January 1, to 11.02 p. m., December 31, 1884, inclusive,  $+0.15$  inoh. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.010; February, 0.010; March, 0.010; April, .010; May, .010; June, .010; July, .010; August, .010; September, .010; October, .010; November, .010; December, .010. REMARKS.—January 6, coldest day in twenty years. March, last frost, 18th. December, first light frost, 10th; first killing frost, 18th.

**WILLIAM DALY**  
*Private, Signal Corps, U. S. A.*

*Meteorological summary for the year ending December 31, 1884—Continued.*

MAGINNIS, FORT, MONT.

Location of office on December 31, 1884, Post Quarters.

[Latitude, 47° 12' N.; longitude, 109° 10' W. Elevation of barometer above sea-level, 4,340 (B) feet. Elevation of exposed thermometer above ground, 6 feet. Elevation of rain-gauge above ground, 23 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.				Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	Washington time.					Monthly mean.					Self-registering thermometers.					Washington time.		Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.		Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	7 p. m.		11 p. m.		Monthly mean.	Maximum.		Minimum.		Absolute range.		Mean maximum.		Total amount.	Largest amount.	Date.	Miles.	Direction.	Date.	Miles.	Direction.	Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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† December.

‡ August.

† March.

\* October.

## MAGINNIS, FORT, MONT.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—							Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calm.			Washington time.						Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 82°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4 52 a. m., 12 52 p. m., and 8 52 p. m., local time.

Correction for instrumental error of barometer used: From 4.32 a. m., January 1, to 8.52 p. m., December 31, 1884, inclusive, + .009 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 4.77; February, 4.75; March, 4.60; April, 4.50; May, 4.41; June, 4.33; July, 4.31; August, 4.31; September, 4.49; October, 4.54; November, 4.60; December, 4.63.

REMARKS.—Auroras, February 19, June 18, July 25, and September 17; mirages, February 15 and 17; killing frost, July 5.

FRANK BURKE,  
Private, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

MARQUETTE, MICH.

Location of office on December 31, 1884, corner Spring and Front streets.

[Latitude, 46° 34' N.; longitude, 87° 24' W. Elevation of barometer above sea-level, 673 feet. Elevation of exposed thermometer above ground, 26 feet. Elevation of rain-gauge above ground, 57 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.			Wind.			Total movement.	
	Washington time.					Monthly mean.					Self-registering thermometers.					Mean maximum.					Any consecutive 8-hourly measurements.			Maximum hourly velocity during month.				
	7 p. m.	9 p. m.	11 p. m.	Range.	Date.	Highest.	Lowest.	Date.	In.	Th.	7 p. m.	9 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absol. range.	Mean maximum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Miles.
1884.																												
Jan.	29.335	29.309	29.325	29.323	29.892	29.892	29.850	30.1.333	7.4	16.3	9.9	10.9	9.4	5.17	19.0	24.63.5	20.0	0.5	.91	.29	13.32	{NW.}	{8}	13.32	{NW.}	{8}	W.	7.067
Feb.	29.327	29.309	29.312	29.316	29.847	29.847	29.800	19.1.157	6.6	14.9	8.9	10.1	13.8	19	20.0	15.58.8	20.3	0.5	.48	.48	12.84	{S.}	{17}	12.84	{S.}	{17}	NW.	5.567
Mar.	29.298	29.272	29.280	29.287	29.764	29.764	29.746	11.1.418	17.2	28.9	22.0	22.7	58.0	24	16.0	1	72.0	32.0	9.1	.74	.35	10.11	28	N.	28	{NW.}	{28}	5.346
Apr.	29.308	29.280	29.286	29.291	29.905	29.905	29.892	27.1.313	83.0	39.5	34.3	35.6	69.0	26	17.9	1	51.1	42.0	25.3	3.94	1.96	14.15	36	NW.	27	{NW.}	{27}	6.419
May.	29.224	29.213	29.216	29.218	29.717	29.717	29.827	18.890	45.7	51.1	44.8	47.2	72.5	30	31.2	2	41.3	54.6	37.8	2.43	.68	18.19	28	NW.	15	{NW.}	{15}	5.345
June.	29.359	29.329	29.323	29.337	29.681	29.681	29.652	7.629	57.2	64.1	57.7	58.7	91.0	29	37.4	10	53.6	71.1	48.1	1.21	.40	1	24	{W.}	{11}	N.	8.974	
July.	29.167	29.173	29.165	29.168	29.440	29.440	29.405	5.745	58.4	63.9	57.5	59.9	88.0	22	43.1	8	42.9	68.2	51.9	2.45	.63	5	28	{W.}	{24}	W.	4.898	
Aug.	29.256	29.242	29.242	29.247	29.625	29.625	29.673	8.28.873	8	68.2	68.2	68.2	90.0	20	38.8	8	51.2	73.0	53.9	5.46	2.28	29	28	{NW.}	{28}	{NW.}	{28}	5.804
Sept.	29.207	29.198	29.219	29.208	29.776	29.776	29.685	24.1.111	56.4	65.2	57.9	59.8	88.8	6	38.0	22	50.8	69.5	51.8	4.91	1.69	23	24	{W.}	{27}	SW.	6.769	
Oct.	29.296	29.273	29.291	29.288	29.631	29.631	29.746	5.1.085	44.6	52.3	45.8	47.6	82.0	19	20.3	23	61.7	56.7	38.2	6.92	2.60	3	35	SW.	16	SW.	6.110	
Nov.	29.275	29.247	29.276	29.266	29.644	29.644	29.742	28.9.02	28.6	35.2	30.2	31.3	64.0	14	6.3	24	70.3	38.3	22.7	2.77	1.14	23	23	SW.	6	W.	8.890	
Dec.	29.268	29.233	29.238	29.233	29.866	29.866	29.787	7.1.079	19.1	22.7	19.4	20.4	57.0	8.4	15.9	17	62.9	26.8	11.4	8.65	2.18	6	7	NW.	9	W.	7.581	
Sum.	251.345	251.139	251.351	251.242	29.414	29.414	29.434	2	44.2	46.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	75.188
Means.	28.279	28.262	28.270	28.270	29.905	29.905	29.846	11.1.034	36.2	43.4	37.4	39.0	91.0	29	30.0	11.5	56.7	47.8	28.9								NW.	

\* One 11 p. m. observation missed.

† April.

‡ March.

§ June.

|| February.



## MARQUETTE, MICH.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew point.				Relative humidity (per cent.)				Cloudiness (in tenths).				Number of days—								
	Number of calm.																												
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 83°.	Minimum below 83°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.																													
Jan.	10	5	0	7	11	6	32	23	1	1.5	3.8	1.0	1.9	67.8	54.8	67.8	63.2	6.3	7	12	12	14	26	31	0	0	0	0	1
Feb.	20	6	9	3	10	8	16	47	2	0.5	1.3	1.9	72.5	63.5	73.4	68.8	6.6	4	15	16	20	25	29	0	0	0	0	1	1
Mar.	16	6	11	6	12	8	16	4	10.1	14.1	14.5	12.9	73.9	62.8	67.1	67.1	5.0	4	15	6	13	20	25	29	0	0	0	2	1
Apr.	19	7	3	17	4	2	11	26	25.0	29.7	24.6	25.4	71.9	59.9	71.4	67.7	3.2	10	10	10	13	17	27	0	2	1	0	0	0
May	19	7	13	17	12	9	11	26	36.2	36.2	33.1	35.6	71.9	59.9	71.4	67.7	3.2	10	14	7	14	0	0	2	0	0	0	0	0
June	15	8	14	14	11	8	5	8	47.9	45.0	48.5	47.1	72.1	56.0	72.2	66.9	3.2	10	16	4	9	0	0	0	0	1	3	1	1
July	13	6	11	8	7	5	21	19	50.3	49.3	48.5	49.3	73.3	60.6	73.2	70.4	3.5	11	13	7	14	0	0	0	0	0	1	0	0
Aug.	11	3	6	10	7	19	13	19	53.9	53.9	53.9	78.6	61.1	78.7	72.8	4.0	5.3	4.9	4.7	11	0	0	0	0	0	0	1	0	0
Sept.	9	4	6	7	8	25	15	12	48.5	49.6	50.2	49.4	71.3	58.6	70.2	66.7	3.0	6	13	6	15	0	0	0	0	0	0	0	0
Oct.	6	5	7	9	9	19	12	24	35.7	36.9	34.0	36.2	71.3	58.6	70.2	66.7	3.0	6	18	11	12	1	24	0	0	0	0	0	0
Nov.	10	2	4	1	7	10	32	24	21.9	23.5	22.6	22.7	75.8	63.8	73.6	71.1	6.6	6	11	13	12	11	24	0	0	0	0	0	0
Dec.	9	2	2	2	9	10	27	21	13.9	14.6	13.4	14.0	80.3	71.9	78.4	76.9	7.6	8.1	7.6	2	11	18	22	19	0	0	0	0	0
Sums	157	66	80	90	105	118	197	244	333.5	351.4	348.5	348.5	887.0	727.1	878.5	831.0	64.3	93	161	111	163	96	178	1	6	5	1	6	5
									Percentages.				Percentages.				Percentages.				Percentages.								
Means	14.3	6.0	7.3	8.2	9.6	10.8	13.0	22.2	28.4	29.5	29.3	29.1	73.9	60.6	73.2	69.2	5.4	25.5	44.1	30.4	45.1	28.2	48.6	31.0	1.6	4	3.1	6.1	4

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.19 a. m., 2.19 p. m., and 10.19 p. m., local time.

Correction for instrumental error of barometer used: From 6.19 a. m., January 1, to 10.19 p. m., December 31, 1884, inclusive, +.004 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.780; February, 0.780; March, 0.770; April, 0.760; May, 0.720; June, 0.720; July, 0.710; August, 0.710; September, 0.720; October, 0.740; November, 0.770; December, 0.780.

F. M. NEAL,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

MEMPHIS, TENN.

Location of office on December 31, 1884, No. 260 Front street.

[Latitude, 35° 9' N.; longitude, 90° 3' W. Elevation of barometer above sea-level 321 feet. Elevation of exposed thermometer above ground, 53 feet. Elevation of rain-gauge above ground, 51 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.			Wind.			Total movement.			
	Washington time.					Monthly mean.					Washington time.					Self-registering ther. monometers.					Any 3 consecutive 8-hourly measure ments.			Maximum hourly velocity during month.						
	Washington time.			Range.	Date.	Lowest.	Hi-hest.	Date.	Lowest.	Hi-hest.	Washington time.			Date.	Minimum.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Maximum velocity during month.	Date.	Prevailing direction.				
	7 p. m.	3 p. m.	11 p. m.								7 a. m.	3 p. m.	11 p. m.															Monthly mean.		
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	Miles.			
Jan.	29.824	29.879	29.921	29.908	30.422	5	29.411	31	1.011	28.4	37.4	33.8	33.0	71.0	30	-2.0	6	73.0	41.3	25.0	5.68	1.23	7	28	NW.	10	SE.	5,156		
Feb.	29.742	29.689	29.733	29.721	30.167	15	29.190	19	.977	43.5	52.3	47.7	47.8	47.7	47.8	72.7	4	18.5	14	54.2	57.1	33.6	9.64	2.41	6	32	NW.	24	SE.	4,462
Mar.	29.691	29.660	29.671	29.674	30.078	9	29.282	25	.796	47.6	57.2	52.8	52.5	52.8	52.5	75.0	28	26.8	2	48.2	61.1	45.1	5.06	1.29	4	30	NW.	27	SE.	4,550
Apr.	29.622	29.604	29.605	29.610	29.900	3	29.116	14	.784	54.8	64.7	59.1	59.5	59.1	59.5	83.0	30	40.5	11	4.5	88.0	51.8	8.00	3.02	14	32	NW.	10	W.	4,067
May*	29.697	29.641	29.650	29.653	29.873	2	29.403	5	.470	64.3	76.3	68.2	69.6	68.2	69.6	86.8	11	54.0	30	32.8	78.4	61.2	4.46	2.72	21	22	SE.	22	S.	3,889
June.	29.671	29.643	29.658	29.657	29.858	17	29.452	9	.406	71.5	81.6	73.5	75.5	73.5	75.5	96.0	22	59.0	10	37.0	84.1	68.8	7.26	3.85	2,9	28	NW.	10	SE.	2,716
July.	29.651	29.622	29.634	29.636	29.791	21	29.419	9	.372	77.2	88.3	80.0	81.8	80.0	81.8	96.5	9	70.0	12	38.5	90.7	72.9	2.38	.76	28	30	NW.	15	NW.	3,823
Aug.	29.741	29.723	29.734	29.733	29.866	9	29.445	29	.421	72.7	84.8	76.9	77.8	76.9	77.8	97.0	29	62.0	11	35.0	88.9	70.4	1.27	.75	26	19	NW.	27	NW.	3,567
Sept.	29.744	29.722	29.738	29.735	29.905	15	29.488	23	.417	70.4	84.5	75.8	76.9	75.8	76.9	94.0	9	61.0	19	33.0	88.3	60.2	4.29	1.07	24	25	SE.	8	SE.	3,845
Oct.	29.830	29.804	29.828	29.821	30.134	23	29.606	26	.528	59.9	74.1	65.0	66.3	65.0	66.3	92.0	1	39.0	24	56.0	75.5	58.0	2.53	1.47	26	27	NW.	8	NW.	3,650
Nov.	29.834	29.800	29.812	29.815	30.243	6	29.249	22	.994	44.5	58.3	50.8	51.7	50.8	51.7	72.2	2,3	28.7	24	47.5	61.0	41.4	2.08	1.34	22	28	NW.	28	W.	3,315
Dec.	29.790	29.753	29.790	29.778	30.235	19	29.264	5	.931	37.5	44.6	41.9	41.3	41.9	41.3	63.1	4	8.1	19	60.0	49.4	33.5	9.14	3.12	29	30	NW.	18	SE.	5,459
Sums	356,907	356,540	356,774	356,741	361,672	14	356,540	14	8,167	672.3	894.1	724.0	732.2	724.0	732.2	964.9	14	543.7	639.7	639.7	639.7	639.7	639.7	639.7	639.7	639.7	639.7	639.7	639.7	639.7
Means	29.742	29.712	29.731	29.728	30.422	15	29.116	14	.680	56.0	67.0	60.3	61.1	60.3	61.1	97.0	329	-2.0	16	45.5	70.0	53.2	9.64	.69	.....	.....	.....	.....	.....	.....

\*One 11 p. m. observation missed.

†January.

‡April.

§ August.

**MEMPHIS, TENN.—Continued.**[illegible]

September.

**† March.**

February.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.08 a. m., 2.03 p. m., and 10.08 p. m. local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive,  $+0.18$  inch.

May, 0.324; June, 0.320; July, 0.310; August, 0.320; September, 0.340; October, 0.240; November, 0.250; December, 0.360. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.360; February, 0.360; March, 0.350; April, 0.340; May, 0.360; June, 0.360; July, 0.350; August, 0.350; September, 0.360; October, 0.360; November, 0.360; December, 0.360.

REMARKS.—January 6, lowest temperature on record—20; January 7, heaviest snow-storm on record, 9.65 inches.

**unates in spring did great destruction, the former to lives, stock, and property, the latter to lives, stock, and property.** **Rosy sunsets and long twilights in spring and fall; earthquake shock about**

11.15 p.m.; November 29; first snow March 4; first frost (killing) October 24; last frost (night) April 25; last frost (killing) March 10; first October 21.

WAS VOL. JOURNALING,  
D. T. FLANNERY.

*Sergeant, Signal Corps, U. S. A.*

*Meteorological summary for the year ending December 31, 1884—Continued.*

MILWAUKEE, WIS.

Location of office on December 31, 1884, Mitchell Building, corner East Water and Michigan streets.

[Latitude, 43° 2' N.; longitude, 87° 54' W. Elevation of barometer above sea-level, 687 feet. Elevation of exposed thermometer above ground, 105 feet. Elevation of rain-gauge above ground, 135 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).						Temperature.						Precipitation.		Wind.								
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Mean maximum.	Mean minimum.	Total amount.	Any consecutive 8-hourly measurements.	Maximum hourly velocity during month.	Prevailing direction.	Total movement.	
	7 a.m.	3 p.m.	11 p.m.							7 a.m.	3 p.m.	11 p.m.	Monthly mean.	Maximum.	Minimum.								Date.
1884.																							
Jan.	29.350	29.329	29.353	29.344	29.874	26	28.692	13	1.183	11.2	16.9	12.8	12.645	1	30	24.8	9	69.4	21.2	0	1.69	.57	10,685
Feb.	29.291	29.266	29.235	29.246	29.745	10	28.696	19	1.059	19.0	24.1	23.3	22.145	0	19	13.3	29	58.3	29.9	13.6	2.71	.08	8,536
Mar.	29.261	29.235	29.243	29.246	29.708	20	28.508	11	1.205	25.8	32.7	30.1	29.5	8	1	26	8.5	66.6	36.3	22.4	2.67	.08	9,260
Apr.	29.213	29.189	29.197	29.200	29.698	21	28.448	15	1.250	37.9	43.7	41.2	40.0	8	80	37.8	8	51.0	47.8	35.4	3.15	.1	8,870
May	29.178	29.173	29.170	29.174	29.645	29.376	19	1.494	51.4	57.2	51.0	53.5	51.0	8	20	35.1	16	44.8	63.6	43.1	1.67	.53	8,098
June	29.311	29.290	29.295	29.299	29.574	14	28.983	8	0.612	63.1	68.1	63.1	60.3	54	23	44.8	20	69.7	74.4	59.0	4.22	.03	8,098
July	29.173	29.158	29.161	29.164	29.477	17	28.924	5	0.513	62.4	70.7	64.3	63.1	54	23	43.2	20	86.3	74.4	59.0	3.80	.01	8,020
Aug.	29.285	29.265	29.263	29.271	29.639	9	28.934	20	0.745	61.4	71.3	64.8	63.1	54	20	48.2	18	70.0	74.4	59.0	1.84	.1	8,020
Sept.	29.294	29.289	29.248	29.250	29.689	12	28.734	24	0.953	59.6	68.1	63.1	64.8	52	10	44.2	18	82.8	72.3	57.6	2.93	.1	7,896
Oct.	29.347	29.314	29.325	29.329	29.739	14	28.616	6	0.848	49.6	58.1	52.3	52.3	51	3	27.2	23	95.9	61.5	42.8	2.18	.04	8,713
Nov.	29.297	29.290	29.291	29.296	29.649	6	28.618	23	1.031	31.2	38.1	34.5	34.5	52	9	31.7	24	66.6	42.7	24.5	1.25	.07	7,910
Dec.	29.304	29.286	29.292	29.294	29.558	25	28.522	6	1.356	30.2	38.2	32.6	32.6	52	81	31.6	19	70.7	29.4	15.0	2.47	.72	9,338
Sums	351.244	351.004	351.082	351.111	351.244	26	28.448	115	11.620	488.3	570.9	520.4	520.4	520.4	122	24.3	5	642.1	438.6	390.57	642.1	...	97,143
Means	29.270	29.280	29.297	29.289	29.574	26	28.448	115	0.968	40.7	47.6	43.4	43.9	50.1	122	24.3	5	642.1	438.6	390.57	642.1	...	97,143

January.

April.

July.

## MILWAUKEE, WIS.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).			Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Washington time.			Relative humidity (per cent.).			Cloudiness (in tenths).			Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
										7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
																															7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
1884.	17	2	0	4	4	19	21	26	0	8.9	9.0	7.8	7.6	72.2	71.0	70.9	70.7	5.3	10	12	6	14	21	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.17 a. m., 2.17 p. m., and 10.17 p. m., local time.

Correction for instrumental error of barometer used: From 6.17 a. m., January 1, to 10.17 p. m., December 31, 1884, inclusive, +.010 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.890; February, 0.890; March, 0.790; April, 0.770; May, 0.740; June, 0.740; July, 0.730; August, 0.730; September, 0.740; October, 0.760; November, 0.790; December, 0.810.

REMARKS.—Last snowfall in spring, April 20; last frost in spring, May 29; first frost in autumn, October 9; first ice in autumn, October 23; first snow in autumn, October 24. The minimum temperature of -21° C recorded on December 19 was the lowest December temperature ever recorded at this station. A brilliant meteor was observed at 7.50 p. m., August 19.

SAMUEL W. RHODE,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

MOBILE, ALA.

Location of office on December 31, 1884, United States Custom-house.

[Latitude, 30° 41' N.; longitude, 88° 2' W. Elevation of barometer above sea-level, 33 feet. Elevation of exposed thermometer above ground, 87 feet. Elevation of rain-gauge above ground, 81 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.											
	Washington time.			Monthly mean.			Washington time.				Self-registering thermometers.			Mean maximum.		Mean minimum.		Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.		Total movement.						
	7 a. m.	3 p. m.	11 p. m.	Date.	Lowest.	Date.	Range.	Monthly mean.	Date.	Maximum.	Minimum.	Date.	Absolute range.	Date.	Total amount.	In.	In.	Date.	Miles.	Direction from—	Date.	Miles.	Direction.							
1884.	In.	In.	In.	In.	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	Miles.						
Jan.....	30.232	30.182	30.224	30.213	30.672	21	29.811	18	.861	38.3	48.9	43.3	43.5	67.0	11	13.9	6	53.1	52.7	34.3	7.40	2.83	23	24	24	N.	24	N.	5,143	
Feb.....	30.094	30.048	30.085	30.076	30.371	15	29.699	27	.672	32.1	64.1	55.7	57.3	75.5	31	28.9	20	46.6	66.2	40.7	5.01	2.05	16	17	28	N	20	S.	4,564	
Mar.....	30.135	30.097	30.046	30.010	30.332	15	29.748	1	.584	56.6	68.7	61.2	62.2	83.9	28	37.0	1	46.9	71.0	54.1	5.34	3.10	17	18	26	SW	18	S.	5,061	
Apr.....	30.967	29.826	29.947	29.917	30.159	9	29.618	5	.511	60.1	74.3	61.1	66.2	83.9	19	43.0	24	42.9	76.4	58.5	5.54	2.40	20	21	28	N.E.	5	S.	4,943	
May.....	29.981	29.940	29.965	29.965	30.147	23	29.781	26	.868	69.7	82.3	71.8	74.6	92.7	24	58.7	9	34.0	86.1	67.4	8.48	2.20	4	5	16	S,SW.	21	S.	3,977	
June.....	29.964	29.931	29.952	29.949	30.139	1	29.731	10	.408	72.9	85.4	75.2	77.8	96.0	20	61.7	12	34.3	88.7	69.8	7.01	1.13	4	5	21	NW.	24	N.	3,696	
July.....	29.978	29.955	29.966	29.966	30.112	24	29.798	10	.319	76.8	84.6	78.8	80.1	95.6	21	69.5	8	38.1	89.7	73.7	4.96	.92	13	28	SE.	6	SW.	4,837		
Aug.....	30.026	29.982	30.015	30.008	30.164	20	29.824	31	.340	72.8	85.6	77.7	78.7	95.9	29	63.0	7	32.9	88.9	71.2	1.26	.66	18	23	N.E.	16	NW.	4,188		
Sept.....	30.046	30.003	30.031	30.025	30.200	15	29.858	1	.342	73.0	84.4	77.5	78.3	94.4	12	61.1	16	33.3	87.5	71.0	1.78	.91	5	6	24	S.E.	23	N.S.	4,498	
Oct.....	30.097	30.045	30.083	30.078	30.352	24	29.877	9	.475	68.4	80.6	69.7	71.7	93.3	18	43.7	24	49.7	82.5	63.6	5.36	2.19	26	27	26	SE.	27	N.	4,310	
Nov.....	30.127	30.078	30.119	30.108	30.373	6	29.814	28	.759	49.6	65.0	53.8	55.5	78.7	8	34.1	25	44.6	67.2	44.7	4.12	1.34	27	28	28	SE.	22	N.	4,289	
Dec.....	30.100	30.059	30.099	30.096	30.410	19	29.645	5	.765	49.7	59.5	52.6	53.9	78.8	22	20.3	19	58.5	62.5	45.0	5.10	1.25	14	24	24	SE.	11	S.E.	5,236	
Sums.....	360.641	360.153	360.517	360.438	.....	.....	4,027	730.0	883.4	781.4	800.3	.....	502.9	919.4	703.3	67.55	.....	.....	.....	.....	.....	.....	.....	.....	54,743					
Means.....	30.053	30.013	30.043	30.036	30.672	21	29.614	128	.534	61.3	73.6	65.1	66.7	96.0	21	13.9	6	41.9	76.6	58.6	.....	.....	.....	.....	.....	.....	.....	.....	N.	.....

\* January.

† November.

‡ June.

## MOBILE, ALA.—Continued.

[illegible]

**January.**

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.16 a. m., 2.16 p. m., and 10.16 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884 inclusive, +.019 inch.

0.040; May, 0.040; June, 0.040; July, 0.040; August, 0.040; September, 0.040; October, 0.040; November, 0.040; December, 0.040.

REMARKS.—Office moved from Mauser Building to Custom-house July 1, 1884. The barometers are 6 feet lower than at former office and the thermometers are 51.76 feet higher. Rain-gauge 30.43 feet higher than at former office. No change in correction for elevation. Severe drought during September and October.

WES. BLAKE,  
Corporal, Signal Corps, U. S. A.





## 387

[illegible]

NOTE.—7 a. m., 3 p. m., and 11 p. m.; Washington time, correspond to 6.23 a. m., 2.23 p. m., and 10.23 p. m., local time. Correction for instrumental error of barometer used: From 6.23 a. m., January 1, to 10.23 p. m., December 31, 1884, inclusive, .000 inch.

**0.23; May, 0.23; June, 0.23; July, 0.22; August, 0.23; September, 0.23; October, 0.23; November, 0.24; December, 0.24.**

The barometric observations may be reduced to sea-level by adding the following constants for the various months: **January, 0.24; February, 0.24; March, 0.24; April, 0.23; May, 0.23; June, 0.23; July, 0.22; August, 0.23; September, 0.23; October, 0.23; November, 0.24; December, 0.24.**

The barometric observations may be reduced to sea-level by adding the following constants for the various months: **January, 0.24; February, 0.24; March, 0.24; April, 0.23; May, 0.23; June, 0.23; July, 0.22; August, 0.23; September, 0.23; October, 0.23; November, 0.24; December, 0.24.**

Correction for instrument used: From 0.23 to 0.24, inclusive, 0.001 inch.

Correction for instrument used: From 0.23 to 0.24, inclusive, 0.001 inch.

**P. T. JENKINS,**  
*Sergeant, Signal Corps, U. S. A.*

*Meteorological summary for the year ending December 31, 1884—Continued*

MOOREHEAD, MINN.

Location of office on December 31, 1884, corner Front and Sixth streets.

[Latitude, 49° 53' N.; longitude, 96° 41' W. Elevation of barometer above sea-level, 923 feet. Elevation of exposed thermometer above ground, 24 feet. Elevation of rain-gauge above ground, 41 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).						Temperature.						Precipitation.				Wind.			
	Washington time.			Monthly mean.	Highest.	Lowest.	Range.	Washington time.						Total amount.		Any 8 consecutive hourly measurements.	Maximum hourly velocity during month.			Total movement.
	7 a. m.	3 p. m.	11 p. m.					7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Direction from—	Date.	Miles.	Prevailing direction.
1884.																				
Jan .....	29.129	29.134	29.150	29.141	29.757	28.396	1.361	—9.4	2.7	—3.7	—3.643.0	17	—43.0	4	98.0	0	S.	24	N.	7,413
Feb .....	29.101	29.085	29.093	29.093	29.670	28.259	1.411	—10.1	2.2	—3.7	—3.937.0	25	—30.0	7	67.0	7.6	S.E.	24	N.	6,680
Mar .....	29.098	29.016	29.006	29.007	29.307	28.290	1.077	7.2	21.8	15.2	14.753.0	27	23.0	8	76.0	28.2	N.	24	N.	6,055
Apr .....	29.016	28.989	29.010	29.005	29.575	28.409	1.166	33.2	45.6	38.0	38.967.5	24	17.0	7	50.5	49.0	S.E.	25	N.	6,413
May .....	28.989	28.950	28.951	28.960	29.310	28.006	1.704	45.5	64.3	53.5	54.485.5	17	28.5	2	67.0	67.0	S.E.	22	N.	7,603
June .....	28.968	28.914	28.932	28.955	29.133	28.675	1.478	61.8	79.0	67.1	69.391.0	20	39.0	9	81.8	81.8	S.	17	S.	8,632
July .....	28.959	28.916	28.919	28.923	29.187	28.694	1.493	57.0	72.0	62.3	64.063.8	9	43.0	13	40.4	75.2	S.	22	S.	7,723
Aug .....	28.955	28.939	28.938	28.944	29.304	28.694	1.710	56.2	74.5	62.2	64.867.8	11	41.9	21	45.9	76.9	N.W.	20	S.	7,368
Sept .....	28.884	28.822	28.881	28.873	29.281	28.370	2.911	49.9	66.0	53.6	57.284.0	5	36.2	20	47.8	68.4	S.	13	S.	7,906
Oct .....	29.080	28.971	28.940	28.944	29.414	28.290	2.124	37.2	62.5	43.5	44.877.7	2	14.5	23	62.8	55.0	S.	25	S.	9,843
Nov .....	29.046	29.069	29.049	29.061	29.495	28.557	2.6	20.3	32.0	23.7	25.366.3	12	—16.0	23	71.3	55.1	N.W.	19	N.	7,150
Dec .....	29.101	29.103	29.134	29.115	29.657	28.484	3.173	3.7	9.3	6.0	9.046.0	2	—31.0	25	60.0	13.5	S.	25	N.	8,104
Sum .....	318.151	317.071	318.118	318.081	329.757	318.348	11.409	552.5	418.5	431.0	431.0	.....	738.7	568.9	.....	.....	.....	.....	.....	87,890
Means .....	29.013	28.998	29.010	29.007	29.757	28.259	1.490	29.4	43.5	34.9	36.991.0	150	—43.0	4	61.4	47.2	.....	.....	.....	.....

\* January.

† February.

‡ June.

## MOOREHEAD, MINN.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—									
	Number of calms.								Washington time.				Washington time.				Washington time.				Washington time.				Number of days—					
North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which, .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.		
1884.																														
Jan.....	34	2	0	10	16	9	4	10	0	0	0	0	0	0	0	0	0	0	0	0	12	16	8	6	27	31	0	0		
Feb.....	39	7	1	9	10	3	4	12	2	11.3	1.8	6.5	6.0	86.7	88.6	89.8	2.7	5.3	2.7	15	27	20	0	0	0	0	0			
Mar.....	20	5	3	15	14	7	12	13	4	4.1	17.1	11.7	6.8	82.6	84.3	87.4	5.2	6.5	4.2	8	15	20	0	0	0	0	0			
Apr.....	37	0	4	12	14	4	1	3	9	27.4	29.0	28.9	28.8	81.5	86.1	85.0	4.2	6.5	4.2	5	18	20	0	0	0	0	0			
May.....	26	16	2	11	14	11	7	5	1	38.5	38.3	40.1	39.0	79.2	73.3	69.8	4.8	6.0	3.8	6	0	19	0	0	0	0	0			
June.....	8	11	3	14	44	3	2	1	4	56.4	57.7	57.4	57.2	43.4	62.6	61.2	3.5	5.9	3.5	6	0	2	0	0	0	0	0			
July.....	23	7	4	9	20	6	7	15	2	52.5	55.1	55.9	54.5	82.0	79.2	73.2	4.0	7.9	4.0	7	0	0	0	0	0	0	0			
Aug.....	17	6	4	7	36	5	8	13	3	53.1	54.7	56.2	54.7	51.6	81.1	73.9	4.4	6.4	2.5	8	3	19	4	0	0	0	0			
Sept.....	17	5	6	11	18	5	14	11	3	45.3	45.9	47.6	46.8	84.6	75.2	70.3	4.7	7.5	4.9	11	0	19	0	0	0	0	0			
Oct.....	16	8	2	13	25	6	11	15	2	31.6	32.0	33.7	32.4	47.9	68.4	65.8	6.1	3.8	3.8	9	2	15	0	0	0	0	0			
Nov.....	23	6	3	2	25	9	4	17	1	16.6	22.2	18.5	19.1	85.6	81.1	78.2	6.2	6.8	4.6	7	13	27	0	0	0	0	0			
Dec.....	27	2	1	2	23	7	11	18	2	1.0	6.3	1.2	2.8	85.0	84.7	84.9	6.2	6.8	6.2	12	24	30	0	0	0	0	0			
Sums ..	287	70	33	115	259	75	80	133	40	304.3	355.8	338.5	333.0	1025.4	937.2	907.3	77.3	50.2	62.2	95	179	92	105	111	180	2	30	10		
Percentages.																														
28.1 6.9 3.0 10.5 23.6 6.8 7.3 12.1 3.6 23.4 29.6 23.2 27.7 85.4 63.3 73.1 4.2 6.4 4.2 26.0 43.9 23.1 23.7 30.3 49.2 6.8 22.7																														
Means.																														

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.41 a. m., 1.41 p. m., and 9.41 p. m., local time.

Corrections for instrumental error of barometer used: From 7 a. m., January 1, to 3 p. m., August 6, inclusive, +.004 inch; from 7 p. m., August 6, to 11 p. m., December 31, 1884, inclusive, —.009 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.11; February, 1.10; March, 1.08; April, 1.06; May, 0.98; June, 0.97; July, 0.96; August, 0.97; September, 0.99; October, 1.02; November, 1.06; December, 1.11.

REMARKS.—Extra barometer substituted for station barometer August 6; hence change in "instrumental error."

L. M. DEY  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

MOUNT WASHINGTON, N. H.

Location of office on December 31, 1884, Signal office, summit.

[Latitude, 44° 10' N.; longitude, 71° 18' W. Elevation of barometer above sea-level, 6,279 feet. Elevation of exposed thermometer above ground, 6 feet. Elevation of rain-gauge above ground, 2 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.			Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
	Washington time.					Self-registering thermometers.					Washington time.					Mean maximum.					Mean minimum.					Any 3 consecutive 8-hourly measurements.			Maximum hourly velocity during month.		Prevailing direction.	Miles.	Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	7 a. m.		3 p. m.		11 p. m.		Monthly mean.		Date.		Minimum.		Date.		Absolute range.		Date.		Mean maximum.		Mean minimum.		Total amount.		Largest amount.		Date.		Direction from—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
1884.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																

\* Inausufficient, owing to frost-work, &c.

† June.

‡ February.

§ December.

## MOUNT WASHINGTON, N. H.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—							Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—																	
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Washington time.				Mean.				Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.											
										7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.										7 a. m.	3 p. m.	11 p. m.	Mean.							
1884.	Jan.....	1	0	0	0	5	0	16	11	58	1.5	3.3	1.9	2.2	80.8	79.3	82.6	80.9	4.2	3.6	4.0	3.9	12	14	9	16	38	31	0	0	0	0	0	0	0		
	Feb.....	0	0	0	1	6	7	9	19	43	11.0	12.8	9.0	10.9	86.7	86.1	87.9	87.9	3.9	5.1	2.8	3.9	9	17	3	22	23	29	28	81	0	0	0	0	0	0	
	Mar.....	5	3	5	3	6	7	17	45	8	6.7	11.3	7.9	8.6	83.1	88.9	86.2	86.1	5.4	4.8	2.8	4.5	10	15	8	20	28	31	30	0	0	0	0	0	0	0	
	Apr.....	13	16	9	5	3	5	3	36	1	21.5	25.5	22.9	23.3	90.7	92.3	92.7	91.9	3.1	2.5	2.6	3.7	19	8	3	18	14	30	0	0	0	0	0	0	0	0	
	May.....	4	2	6	6	6	9	13	47	0	23.9	32.4	29.9	30.4	94.7	92.5	95.8	94.2	4.6	5.7	3.9	4.7	7	19	6	19	7	22	0	0	0	0	0	0	0	0	
	June.....	4	8	3	0	1	10	37	26	1	39.1	44.8	41.1	41.7	77.9	76.5	81.2	78.2	2.9	4.3	1.7	3.0	16	12	6	13	0	1	3	0	0	0	0	0	0	0	
	July.....	1	4	2	7	4	11	26	37	1	41.3	45.2	42.2	42.9	93.7	93.1	96.2	94.3	4.7	4.7	4.7	4.7	8	16	7	24	0	1	0	0	0	0	0	0	0	0	
	Aug.....	2	7	4	3	9	20	23	24	1	42.5	47.2	45.0	44.9	91.0	87.4	93.5	90.6	3.2	5.0	2.7	3.6	13	18	5	16	0	1	0	0	0	0	0	0	0	0	
	Sept.....	0	0	0	0	5	9	35	40	1	38.9	41.1	39.9	40.0	97.5	91.5	95.8	94.9	1.3	3.4	2.5	2.4	18	12	0	17	2	11	0	0	0	0	0	0	0	0	
	Oct.....	2	3	1	0	4	12	24	48	0	25.4	27.0	20.5	23.3	93.0	89.8	94.6	92.5	3.6	3.1	4.6	3.8	10	15	0	18	26	20	26	0	0	0	0	0	0	0	
	Nov.....	0	0	0	5	5	12	16	52	0	15.0	16.4	15.7	15.7	96.8	96.3	95.2	95.8	2.8	1.4	3.3	2.5	19	12	0	18	24	24	28	0	0	0	0	0	0	0	0
	Dec.....	6	1	0	2	5	9	24	44	2	11.1	11.8	13.1	12.0	93.1	90.2	95.2	92.8	2.0	2.8	1.3	2.0	19	12	0	12	24	20	24	0	0	0	0	0	0	0	
	Sums ..	38	42	31	42	55	129	248	500	13	282.9	318.8	285.1	298.9	1,079.0	1,064.9	1,093.4	1,080.1	41.7	451.9	37.8	41.7	159	163	44	209	162	245	0	12	9	0	12	9	0	9	
	Means ..	3.6	3.8	2.8	3.8	5.0	11.8	22.6	6.4	5.5	23.6	26.6	24.6	24.9	83.9	83.7	91.4	90.0	3.6	3.8	3.2	3.5	43.4	44.5	12.0	57.1	44.3	68.9	0	0.3	32.5	0	0.3	32.5	0	0.3	
	Percentages.																								Percentages.												

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time correspond to 7.23 a. m., 3.23 p. m., and 11.23 p. m., local time. Corrections for instrumental error of barometer used: From 7.23 a. m., January 1, to 3.23 p. m., June 13, inclusive, +.003 inch; from 7.23 p. m., June 13, 1884, to 11.23 p. m., December 31, 1884, inclusive, —.003 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 6.630; February, 6.620; March, 6.620; April, 6.610; May, 6.120; June, 6.120; July, 6.070; August, 6.080; September, 6.150; October, 6.340; November, 6.560; December, —6.630.

REMARKS.—Station barometer No. 1857 broken June 13; extra barometer No. 505 substituted and the first observation taken with it was the 7.23 p. m. (local time). June 13; frosts occurred during each month of the year. The year has been noted for the grandeur of its sunrises and sunsets; all the characteristics which have lately attracted such universal attention have been observed here. On nearly all clear days the copper-colored band around the sun has also been observed.

EDWARD A. BEALS,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

MYER, FORT, VA.

[Latitude, 38° 39' N.; longitude 77° W. Elevation of barometer above sea-level, 287 feet. Elevation of exposed thermometer above ground, 43.47 feet. Elevation of rain-gauge above ground, 1.17 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Month.		Washington time.			Monthly mean.			Washington time.			Self-registering thermometers.			Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
		7 p. m.	3 p. m.	11 p. m.	In.	Th.	W.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.		Mean minimum.	Total amount.		Last 8 days.	Date.	Miles.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
1884.		In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	°	°	°	°	°	°	°	°	°	In.	Th.	W.	°	°	°	In.	Th.	W.	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°

July.

April.

January.

For 29 days.

For 30 days.

For 30 days.

For 27 days.

MYER, FORT, VA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—								Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	Number of calms.								7 a. m.		3 p. m.		11 p. m.		Mean.		7 a. m.		3 p. m.		11 p. m.		Mean.		Clear.	Fair.	Cloudy.	(In which of more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 30°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7 a. m., 3 p. m., and 11 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.003 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.300; February, 0.300; March, 0.300; April, 0.290; May, 0.280; June, 0.280; July, 0.280; August, 0.280; September, 0.280; October, 0.280; November, 0.300; December, 0.300.

GEO. HEATHCOTE,  
Sergeant, Signal Corps, U. S. A.





## MYER, FORT, VA.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m. Washington time: Number of times observed blowing from—								Dew-point.	Relative humidity (per cent.).	Cloudiness (in tenths).	Washington time.												Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.				Number of calms.	Mean.				Mean.				Clear.	Fair.	Cloudy.	(in which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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NOTE.—7 a. m., 3 p. m., and 11 p. m.; Washington time, correspond to 7 a. m., 3 p. m., and 11 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.003 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.200; April, 0.200; May, 0.280; June, 0.280; July, 0.280; August, 0.280; September, 0.280; October, 0.280; November, 0.280; December, 0.280.

GEO. HEATHCOTE  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

NASHVILLE, TENN.

Location of office on December 31, 1884, Barnes' Block, Public Square and North Market street.

[Latitude, 36° 30' N.; longitude, 86° 47' W. Elevation of barometer above sea-level, 549 feet. Elevation of exposed thermometer above ground, 61 feet. Elevation of rain-gauge above ground, 79 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.			Total movement.			
	Washington time.			Monthly mean.			Self-registering thermometers.				Any consecutive 3-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.														
	7 A. M.		11 P. M.	Date.		Lowest.		Highest.		Washington time.		Minimum.		Absolute range.		Mean maximum.		Mean minimum.		Total amount.		Date.		Miles.			Direction.		Date.
	<i>T<sub>a</sub></i>	<i>T<sub>w</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>a</sub></i>	<i>T<sub>w</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>a</sub></i>	<i>T<sub>w</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>a</sub></i>	<i>T<sub>w</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>a</sub></i>	<i>T<sub>w</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>a</sub></i>	<i>T<sub>w</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>a</sub></i>	<i>T<sub>w</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>a</sub></i>	<i>T<sub>w</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>a</sub></i>		<i>T<sub>w</sub></i>	<i>T<sub>m</sub></i>	
1864.																													Miles.
Jan.	29.600	29.611	29.657	29.643	30.074	29.136	31.133	29.31	29.136	30.074	30.185	30.185	30.185	30.185	30.185	30.185	30.185	30.185	30.185	30.185	30.185	30.185	7.8	31	NW.	36	31	NW.	5,320
Feb.	29.504	29.442	29.479	29.479	29.809	29.856	19.1353	42.1	51.4	44.6	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07	7.8	19	E. S.	49	19	E. S.	5,182	
Mar.	29.462	29.419	29.496	29.498	29.828	29.855	1.8778	43.7	54.3	49.2	49.17	49.17	49.17	49.17	49.17	49.17	49.17	49.17	49.17	49.17	49.17	25.31	1	W.	49	1	SE.	5,485	
Apr.	29.377	29.345	29.359	29.360	29.599	29.599	1.742	50.8	62.5	55.7	56.381	56.381	56.381	56.381	56.381	56.381	56.381	56.381	56.381	56.381	56.381	14	46	NW.	46	2	SE.	5,427	
May	29.422	29.377	29.401	29.400	29.614	29.614	.445	62.2	75.4	67.2	68.387	68.387	68.387	68.387	68.387	68.387	68.387	68.387	68.387	68.387	68.387	13.14	36	SW.	36	4	NW.	5,028	
June	29.442	29.400	29.418	29.420	29.660	29.660	.561	68.5	78.9	71.8	73.192	73.192	73.192	73.192	73.192	73.192	73.192	73.192	73.192	73.192	73.192	5.6	36	NW.	36	9	E.	3,824	
July	29.393	29.357	29.373	29.374	29.568	29.568	.979	72.6	85.2	76.6	76.193	76.193	76.193	76.193	76.193	76.193	76.193	76.193	76.193	76.193	76.193	6	47	NW.	47	5	W.	3,294	
Aug.	29.506	29.453	29.480	29.480	29.609	29.609	.450	68.5	84.0	73.7	75.694	75.694	75.694	75.694	75.694	75.694	75.694	75.694	75.694	75.694	75.694	3	38	NW.	38	29	NW.	3,100	
Sept.	29.539	29.468	29.501	29.499	29.723	29.723	.431	67.3	82.5	73.2	74.891	74.891	74.891	74.891	74.891	74.891	74.891	74.891	74.891	74.891	74.891	27.27	23	S.	27	22	E.	3,182	
Oct.	29.593	29.542	29.566	29.569	29.859	29.859	.531	68.1	83.6	73.6	85.291	85.291	85.291	85.291	85.291	85.291	85.291	85.291	85.291	85.291	85.291	29.31	23	SE.	31	26	NW.	2,960	
Nov.	29.565	29.526	29.550	29.547	29.940	29.940	.853	41.0	54.4	46.9	48.173	48.173	48.173	48.173	48.173	48.173	48.173	48.173	48.173	48.173	48.173	23.40	23	SE.	23	28	SE.	3,547	
Dec.	29.557	29.515	29.531	29.541	29.969	29.969	1.052	36.9	44.6	39.7	40.467	40.467	40.467	40.467	40.467	40.467	40.467	40.467	40.467	40.467	40.467	14	30	W.	30	14	SE.	5,310	
Sums	354.012	353.455	353.765	353.761	353.761	353.761	8.311	687.4	784.2	691.6	704.4	704.4	704.4	704.4	704.4	704.4	704.4	704.4	704.4	704.4	704.4	596.1	1819	3072	54.07				52,789
Means	29.501	29.455	29.462	29.478	29.614	29.614	.693	68.1	65.4	57.6	58.794	58.794	58.794	58.794	58.794	58.794	58.794	58.794	58.794	58.794	58.794	6	49.7	68.3	50.2			NW.	.....

\*January.

†February.

‡July.



*Meteorological summary for the year ending December 31, 1884—Continued.*

NEW HAVEN, CONN.

Location of office on December 31, 1884, Insurance Building, No. 370 Chapel street.

[Latitude, 41° 18' N.; longitude, 72° 56' E. Elevation of barometer above sea-level, 107 feet. Elevation of exposed thermometer above ground, 112 feet. Elevation of rain-gauge above ground, 109 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.			Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	Washington time.			Monthly mean.			Higheest.			Date.			Range.			7 a. m.			3 p. m.			11 p. m.			Washington time.			Self-registering thermometers.			Mean maximum.			Mean minimum.			Any 8 consecutive hourly measurements.			Maximum hourly velocity during month.			Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	7 p. m.	3 p. m.	11 p. m.	In.	In.	In.	Date.	Lowest.	In.	In.	In.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.			Date.	Miles.	Direction.	Date.	Miles.	Direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In

\* January.

† February.

‡ June.

§ December.

## NEW HAVEN, CONN.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—					
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Washington time.				Mean.				Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.	
									7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.										7 a. m.
1884.																										
Jan.....	16	19	1	0	4	23	18	10	2	14.0	17.1	15.6	15.6	78.9	67.6	74.0	73.5	5.3	6.7	2.8	30	0	0	0	0	
Feb.....	21	16	6	10	6	6	17	11	2	26.7	26.8	25.6	26.4	88.2	75.0	82.7	82.0	7.0	6.8	3.5	23	0	0	0	0	
Mar.....	21	15	3	2	6	7	12	15	2	24.0	26.3	25.6	25.3	80.4	63.5	76.2	73.4	6.4	6.4	4.0	16	0	0	0	0	
Apr.....	29	14	3	5	7	5	17	11	2	34.3	34.5	34.8	34.5	74.7	58.0	75.5	69.4	6.3	5.7	4.5	14	0	0	0	0	
May.....	6	10	4	9	19	9	12	22	6	44.9	44.5	44.6	44.6	74.7	57.0	77.0	69.6	4.5	4.5	3.8	16	0	0	0	0	
June.....	6	12	5	11	22	20	23	13	6	56.0	55.9	55.6	55.8	78.2	53.9	80.5	70.9	2.1	3.1	2.8	9	0	0	0	0	
July.....	13	5	4	4	22	16	13	8	9	58.4	59.1	60.0	59.1	80.3	63.6	83.1	75.7	5.2	4.9	4.0	9	0	0	0	0	
Aug.....	16	10	3	5	29	15	3	8	9	61.2	62.1	62.3	61.9	86.9	65.3	86.4	79.5	4.6	5.0	3.5	13	0	0	0	0	
Sept.....	13	5	1	3	14	28	4	12	10	56.4	57.8	58.0	57.4	83.5	58.8	82.0	74.8	3.2	3.0	2.6	7	0	0	0	0	
Oct.....	21	6	1	1	5	26	8	21	4	43.0	44.1	44.4	43.8	80.1	59.4	75.6	72.7	3.5	5.2	3.4	6	0	0	0	0	
Nov.....	17	4	2	2	3	21	18	10	3	30.7	33.7	33.2	32.5	79.1	63.1	77.9	73.4	4.1	3.7	3.0	11	0	0	0	0	
Dec.....	20	19	1	1	1	17	18	10	6	23.8	26.3	26.2	25.4	84.8	72.9	80.8	79.5	5.8	6.3	4.1	8	21	0	0	0	
Sums..	199	135	34	53	139	193	120	159	64	478.4	488.2	485.8	482.3	939.8	758.1	954.7	894.4	59.2	63.6	45.8	147	30	115	1	10	6
Percentages.																										
Percentages.																										
Percentages.																										
Means.	18.1	12.3	3.1	4.9	12.7	17.8	10.1	14.5	5.8	39.4	40.7	40.5	40.2	80.8	63.2	79.6	74.5	4.9	5.2	3.8	40.2	8.2	31.4	.3	27.1	1.6
Percentages.																										
Percentages.																										
Percentages.																										

Note.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond to 7.16 a. m., 8.16 p. m., and 11.16 p. m., local time.  
Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, + .007 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.120; February, 0.120; March, 0.120; April, 0.120; May, 0.120; June, 0.110; July, 0.110; August, 0.110; September, 0.110; October, 0.120; November, 0.120; December, 0.120.

J. H. SHERMAN  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

NEW LONDON, CONN.

Location of office on December 31, 1884, United States custom-house.

[Latitude 41° 21' N.; longitude, 73° 5' W. Elevation of barometer above sea-level, 47 feet. Elevation of exposed thermometer above ground, 29 feet. Elevation of rain-gauge above ground, 65 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.			Wind.										
	Washington time.			Monthly mean.			Washington time.			Self-registering thermometer.			Mean maximum.			Any 3 consecutive hourly measurements.			Maximum hourly velocity during month.											
	7 a. m.	3 p. m.	11 p. m.	In.	In.	In.	Date.	Lowest.	Date.	In.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean minimum.			Total amount.	Amount.	Date.	Miles.	Direction.	Date.	Prevailing direction.	Total movement.
																				Mean minimum.	Mean maximum.	Mean minimum.								
1884.																														
Jan.	30.124	30.049	30.067	30.080	30.783	27	29.182	29.182	2	1.601	22.9	29.5	25.8	26.1	151.5	9	6.0	44.5	33.5	13.7	8.9	1.22	8.9	1.22	8.9	42	SE.	9	NW.	0.782
Feb.	30.012	29.997	30.070	30.036	30.732	16	28.918	28.918	2	1.814	31.8	30.8	32.0	33.5	51.5	13	3.0	29.4	48.5	41.0	23.3	6.21	23.3	6.21	23.3	38	E.	20	NW.	5.585
Mar.	29.986	29.940	29.964	29.963	30.435	26	29.458	29.458	26	0.977	32.2	39.6	35.0	35.8	60.0	24	4.0	1.5	58.0	43.5	19.2	5.53	5.53	19.2	32	W.	20	NW.	6.139	
Apr.	29.790	29.745	29.794	29.776	30.148	14	29.050	29.050	3	1.088	43.5	49.7	42.9	45.4	67.0	30	23.0	38.0	53.5	38.1	3.29	3.29	3.29	15.16	28	W.	30	W.	4.978	
May	29.918	29.882	29.929	29.910	30.291	31	29.496	29.496	10	0.795	55.1	59.9	52.4	55.8	82.0	24	34.7	30.4	48.3	65.1	46.5	5.64	5.64	6.7	28	NW.	7	SW.	6.583	
June	30.076	30.042	30.055	30.038	30.509	15	29.752	29.752	9	0.757	64.8	69.4	61.1	65.1	87.5	21	43.0	15.4	45.7	74.7	55.5	6.29	6.29	25.26	24	SE.	23	SW.	4.066	
July	29.828	29.703	29.810	29.810	30.008	4	29.547	29.547	13	4.661	66.4	71.2	64.9	67.3	88.0	24	55.0	16.0	28.0	74.3	60.5	6.02	6.02	1.49	28	SE.	23	SW.	4.696	
Aug.	30.038	30.000	30.030	30.026	30.307	25	29.711	29.711	31	1.596	66.9	72.5	66.1	68.5	98.8	20	47.5	25.0	38.2	75.5	62.0	7.13	7.13	2.38	22	S.	26	S.	3.796	
Sept.	30.081	30.035	30.068	30.061	30.443	14	29.698	29.698	17	0.745	64.2	72.3	64.1	66.9	88.8	10	45.4	15.0	43.4	74.9	68.7	1.22	1.22	0.51	29	SW.	16	SW.	3.854	
Oct.	30.111	30.050	30.065	30.065	30.528	26	29.650	29.650	17	1.872	51.8	59.0	53.0	54.6	79.2	1	30.6	26.0	48.6	62.6	45.8	2.33	2.33	1.05	20	SW.	23	SW.	5.244	
Nov.	30.043	30.012	30.015	30.023	30.480	8	29.839	29.839	29	1.121	30.4	47.2	42.2	42.9	60.6	17	22.8	25.0	37.8	51.8	35.0	2.78	2.78	1.24	28	W.	23	W.	5.439	
Dec.	30.138	30.092	30.103	30.111	30.664	27	29.533	29.533	7	1.151	31.7	37.4	34.4	34.5	57.3	7	-5.2	20.0	62.5	41.4	27.7	7.86	7.86	2.27	40	SE.	7	SW.	6.124	
Sums	360.176	359.646	359.996	359.939	360.176	27	29.533	29.533	11	11.988	570.8	644.5	574.4	598.7	.....	.....	.....	539.3	691.8	506.8	601.88	.....	.....	.....	6.7	40	SE.	.....	SW.	62.286
Means	30.015	29.970	30.000	29.993	30.783	27	29.533	29.533	11	1.999	47.6	53.7	47.9	49.7	88.8	10	-5.2	20.0	62.5	41.4	27.7	7.86	7.86	2.27	40	SE.	.....	SW.	.....	

† January. ‡ September. § December.

\* January.

† February.

‡ September.

§ December.

## NEW LONDON, CONN.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m. Washington time: Number of times observed blowing from—								Dew-point.			Relative humidity (per cent.).			Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	Number of calms.								Washington time.			Mean.			Mean.			Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond to 7.20 a. m., 3.20 p. m., and 11.20 p. m., local time. Correction for instrumental error of barometer used: From 7.20 a. m., January 1, to 11.20 p. m., December 31, 1884, inclusive, +.005 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.050; February, 0.050; March, 0.050; April, 0.050; May, 0.050; June, 0.050; July, 0.050; August, 0.050; September, 0.050; October, 0.050; November, 0.050; December, 0.050.

REMARKS.—January, the most destructive gale for years occurred on the 29th; February, severe storms on the 1st, 20th, 23d, and 29th; March, gales on the 19th, 26th, and 30th; April, very mild weather after first week; May, unusual displays of sheet-lightning on the 23d, 24th, and 24th; June, last frost of the season on the 15th, mirage 23d, very heavy rain 25th and 26th; July, remarkably low barometer and very small range; August, earthquake on the 10th, at 2.12 p. m.; September, highest temperature of the year on the 10th, very dry month; October, first light frost on the 10th, first killing frost 16th, mirage 15th; November, first snow 19th, remarkable meteor 5th, very severe gale 23d and 24th; December, extremes of temperature, lowest of the year on the 20th, dangerous gales, large rainfall.

JNO. G. LYNCH,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

NEW LONDON, CONN.

Location of office on December 31, 1884, United States custom-house.

[Latitude 41° 21' N.; longitude, 72° 5' W. Elevation of barometer above sea-level, 47 feet. Elevation of exposed thermometer above ground, 20 feet. Elevation of rain-gauge above ground, 53 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.				Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	Washington time.					Monthly mean.					Self-registering thermometer.					Mean maximum.					Any 8 consecutive 8-hourly measurements.				Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	Washington time.			Range.	Date.	Lowest.	Date.	Highest.	Date.	Lowest.	Date.	Mean.	Monthly.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.			Total amount.	Last amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	7 A. M.	3 P. M.	11 P. M.																Mean.	Minimum.	Maximum.									Mean maximum.	Mean minimum.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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Jan.	30.124	30.049	30.067	30.080	30.783	27	29.182	2	1.601	22.9	23.5	23.5	23.8	28.151.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

\* January.

† February.

‡ September.

§ December.



## NEW LONDON, CONN.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—								Dew-point.	Relative humidity (per cent.).	Cloudiness (in tenths).					Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.			Number of calms.	Washington time.					Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 82°.	Minimum below 82°.	Maximum above 90°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.20 a. m., 3.20 p. m., and 11.20 p. m., local time.

Correction for instrumental error of barometer used: From 7.20 a. m., January 1, to 11.20 p. m., December 31, 1884, inclusive, + .005 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.050; February, 0.050; March, 0.050; April, 0.050; May, 0.050; June, 0.050; July, 0.050; August, 0.050; September, 0.050; October, 0.050; November, 0.050; December, 0.050.

REMARKS.—January, the most destructive gale for years occurred on the 20th; February, severe storms on the 1st, 20th, 23d, and 29th; March, gales on the 19th, 26th, and 30th; April, very mild weather after first week; May, unusual displays of sheet-lightning on the 23d, 24d, and 24th; June, last frost of the season on the 15th, mirage of the very heavy rain 25th and 26th; July, remarkably low barometer and very small range; August, earthquake on the 10th, at 2.12 p. m.; September, highest temperature of the year on the 10th, very dry month; October, first light frost on the 10th, mirage 15th; November, first snow 19th, remarkable meteor 5th, very severe gale 23d and 24th; December, extremes of temperature, lowest of the year on the 20th, dangerous gales, large rainfall.

JNO. G. LYNCH  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

MOBILE, ALA.

Location of office on December 31, 1884, United States Custom-house.

[Latitude, 30° 41' N.; longitude, 88° 2' W. Elevation of barometer above sea-level, 35 feet. Elevation of exposed thermometer above ground, 87 feet. Elevation of rain-gauge above ground, 81 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.			Total movement.							
	Washington time.			Monthly mean.			Washington time.			Self-registering thermometers.			Mean maximum.		Mean minimum.		Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.										
	7 a. m.		3 p. m.	11 p. m.		Monthly mean.	Maximum.		Date.	Minimum.	Date.	Absolute range.		Total amount.		Total amount.		Maximum hourly velocity during month.											
	7 a. m.	3 p. m.	11 p. m.	Range.	Date.	Lowest.	Highest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Direction.	Miles.	Date.	Prevailing direction.								
1884.																							Miles.						
Jan.....	30.232	30.182	30.224	30.213	30.672	21	29.811	18	.861	38.3	48.9	43.3	43.5	67.0	11	13.9	6	53.1	52.7	34.3	7.40	2.83	23, 24	24	N.	24	N.	5, 143	
Feb.....	30.094	30.048	30.065	30.076	30.371	15	29.695	27	.672	32.1	64.1	55.7	37.3	75.5	31	28.9	20	46.6	66.2	40.7	5.01	2.05	16, 17	28	N	20	S	4, 564	
Mar.....	30.135	29.997	30.016	30.010	30.332	15	29.748	1	.584	56.6	68.7	61.2	62.8	81.9	28	37.0	1	46.9	71.0	54.4	11.53	4.30	17, 18	29	SW	18	S	5, 061	
Apr.....	29.967	29.926	29.947	29.917	30.159	9	29.648	5	.511	60.1	74.3	61.1	66.2	85.9	19	43.0	24	42.9	76.4	58.5	5.54	2.40	20, 21	28	N.E.	5	S	4, 943	
May.....	29.981	29.949	29.965	29.965	30.147	23	29.781	26	.866	69.7	82.3	71.8	74.6	92.7	24	58.7	9	34.0	80.1	67.4	8.48	2.20	4, 5	16	S.S.W.	21	S	3, 977	
June.....	29.964	29.931	29.952	29.949	30.139	1	29.731	10	.408	72.9	85.4	75.2	77.8	96.0	21	61.7	12	34.3	83.7	69.8	7.01	1.13	4, 5	21	N.W.	24	N.	3, 696	
July.....	29.978	29.953	29.968	29.966	30.112	24	29.793	10	.319	76.8	84.6	78.8	80.1	95.6	21	68.5	8	36.1	89.7	73.7	4.96	.92	13	28	SE.	6	SW.	4, 837	
Aug.....	30.026	30.082	30.015	30.008	30.164	20	29.824	31	.346	72.8	85.6	77.7	78.7	95.9	29	63.0	7	32.9	88.9	71.2	1.26	.66	18	23	N.E.	16	N.W.	4, 188	
Sept.....	30.010	30.001	30.031	30.025	30.200	15	29.858	1	.342	73.0	84.4	77.5	78.3	94.4	12	61.1	16	33.3	87.5	71.0	1.78	.91	5, 6	24	S.E.	22	N.S.	4, 498	
Oct.....	30.097	30.045	30.083	30.076	30.452	24	29.877	9	.475	68.4	80.6	69.7	72.9	93.4	8	43.7	24	49.7	82.5	63.6	5.96	2.30	26, 27	29	SE.	27	N.	4, 310	
Nov.....	30.127	30.078	30.119	30.108	30.373	6	29.614	28	.759	47.6	63.0	53.8	55.5	78.7	8	34.1	25	44.6	67.2	44.7	4.12	1.34	27, 28	28	SE.	23	N.	4, 389	
Dec.....	30.100	30.059	30.099	30.086	30.410	19	29.645	5	.765	49.7	59.5	52.6	53.9	73.8	22	20.3	19	58.5	62.5	45.0	5.10	1.25	14	24	SE.	11	SE.	5, 236	
Sums.....	306.641	306.153	306.517	306.438	306.672	21	29.614	128	6.402	736.0	881.4	800.3	780.3	919.9	703.3	567.55	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	54, 742
Means.....	30.053	30.013	30.043	30.036	30.672	21	29.614	128	.534	61.3	73.6	65.1	66.7	96.0	21	13.9	6	41.9	76.6	58.6	.....	.....	.....	.....	.....	.....	.....	N.	.....

\* January.

† November.

‡ June.

## MOBILE, ALA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—							Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—							River.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.			Washington time.							Clear.	Rain.	Cloudy.	On which .01 inch or more precipitation fell.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Highest.	Date.	Lowest.	Date.	Range.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
								7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Rain.			Cloudy.												On which .01 inch or more precipitation fell.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Highest.	Date.	Lowest.	Date.	Range.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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† January.

\* October.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.16 a. m., 2.16 p. m., and 10.16 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.019 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.040; February, 0.040; March, 0.040; April, 0.040; May, 0.040; June, 0.040; July, 0.040; August, 0.040; September, 0.040; October, 0.040; November, 0.040; December, 0.040.

REMARKS.—Office moved from Mauser Building to Custom-house July 1, 1884. The barometers are 6 feet lower than at former office and the thermometers are 51.75 feet higher. Rain-gauge 30.43 feet higher than at former office. No change in correction for elevation. Severe drought during September and October.

WES. BLAKE,  
Corporal, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

MONTGOMERY, ALA.

Location of office on December 31, 1884, No. 10 Market street.

[Latitude, 32° 22' N; longitude, 86° 18' W. Elevation of barometer above sea-level, 219 feet. Elevation of exposed thermometer above ground, 24 feet. Elevation of rain-gauge above ground, 58 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.			Total movement																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	Washington time.				Monthly mean.		Highest.		Lowest.		Range.		Washington time.				Self-registering ther- mometers.		Mean maximum.		Mean minimum.		Any 3 con- secutive 8-hourly mea- sure- ments.		Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	7 P. M.	3 P. M.	11 P. M.		In.	Un.	In.	Un.	In.	Un.	In.	Un.	7 A. M.	3 P. M.	11 P. M.	Monthly mean.	Maximum.	Date.	Absolute range.	Mean maximum.	Total amount.		Largest amount.	Date.	Miles.	Direction from—		Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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\* January.

† November.

‡ August.

## MONTGOMERY, ALA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time : Number of times observed blowing from—								Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).					Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	Number of calms.								7 a. m.				3 p. m.				11 p. m.				Mean.				Clear.	Part.	Cloudy.	On wh. chl. or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
									North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.										7 a. m.	3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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Notes.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond to 6.28 a. m., 2.23 p. m., and 10.23 p. m., local time.

Correction for instrumental error of barometer used: From 6.23 a. m., January 1, to 10.23 p. m., December 31, 1884, inclusive, .000 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.24; February, 0.24; March, 0.24; April, 0.23; May, 0.23; June, 0.23; July, 0.23; August, 0.23; September, 0.23; October, 0.23; November, 0.24; December, 0.24.

REMARKS.—First light frost observed October 17; first killing frost observed November 7.

P. T. JENKINS,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued*

MOORHEAD, MINN.

Location of office on December 31, 1884, corner Front and Sixth streets.

[Latitude, 46° 52' N.; longitude, 96° 41' W. Elevation of barometer above sea-level, 923 feet. Elevation of exposed thermometer above ground, 24 feet. Elevation of rain-gauge above ground, 41 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.			Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
Month.	Washington time.						Monthly mean.			Washington time.			Self-registering thermometers.						Total amount.	Any 3 consecutive 8-hourly measure-ments.	Maximum hourly ve-locity during month.			Prevailing direction.	Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	7 a. m.			3 p. m.			11 p. m.			Monthly mean.	Maximum.		Date.	Minimum.	Date.	Absolute range.	Direction from—	Miles.			Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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\* January.

† February.

‡ June.

## MOORHEAD, MINN.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—								Dew-point.			Relative humidity (per cent.).		Cloudiness (in tenths).				Number of days—												
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Washington time.			Mean.		7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.			
										7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.														8 p. m.	11 p. m.	Mean.
1884.																														
Jan.....	34	2	0	10	16	9	4	10	8	10.9	-0.7	-6.5	-9.0	94.0	83.7	83.6	89.8	4.4	5.3	2.7	4.1	12	16	3	6	27	31	0	0	0
Feb.....	39	7	1	9	10	3	4	12	2	11.3	-1.8	-7.2	-6.8	95.3	82.6	84.3	87.4	4.1	6.5	5.2	3.3	8	12	9	15	18	29	0	0	0
Mar.....	20	5	3	15	14	7	12	13	4	4.1	17.1	11.7	11.0	87.4	81.5	86.1	85.0	4.9	6.5	4.2	3.5	3	8	15	8	15	29	0	0	0
Apr.....	37	6	4	12	14	4	1	5	9	27.4	29.0	29.9	28.8	78.2	53.9	73.3	66.8	5.9	6.0	4.8	3.5	5	10	9	12	16	19	0	0	0
May.....	26	16	2	11	14	11	7	3	2	38.5	38.8	40.1	39.0	77.6	43.4	62.6	61.2	5.0	6.2	3.8	3.5	6	9	16	6	0	0	0	0	0
June.....	8	11	3	14	44	3	2	1	4	56.4	57.7	57.4	57.2	82.0	49.2	71.6	67.8	5.3	5.9	3.5	4.9	7	17	6	6	0	0	0	0	0
July.....	23	7	4	9	20	6	7	15	2	52.5	55.1	55.9	54.5	85.0	55.5	79.2	73.2	4.6	7.9	2.5	4.5	6	18	7	12	0	0	0	0	0
Aug.....	17	6	4	7	36	5	8	13	2	53.1	54.7	56.2	54.7	89.1	51.6	81.1	73.9	4.4	6.4	2.5	4.4	7	19	4	11	0	0	0	0	0
Sept.....	17	5	6	11	18	5	14	11	3	45.3	45.9	47.6	46.8	84.6	51.2	75.2	69.4	4.7	7.5	4.9	3.7	5	17	8	9	2	13	0	0	0
Oct.....	16	3	2	13	25	6	11	15	2	81.6	82.0	83.7	82.4	80.0	47.9	68.2	85.8	5.5	6.1	3.8	5.1	8	15	8	11	0	0	0	0	0
Nov.....	23	6	3	2	25	9	4	17	1	16.6	22.2	18.5	19.1	85.6	68.0	81.1	78.2	4.7	6.8	6.2	5.2	9	12	9	7	13	27	0	0	0
Dec.....	27	2	1	2	23	7	11	18	2	1.0	6.3	1.2	2.8	85.0	85.1	84.7	84.9	5.7	6.8	6.3	6.2	13	12	12	12	24	30	0	0	1
Sums ..	287	76	33	115	259	75	80	133	40	304.3	355.8	338.5	333.0	1025.4	759.6	937.2	907.3	59.2	77.3	50.2	62.2	95	179	92	105	111	180	2	30	10
										Percentages.										Percentages.										
28.1 6.9 3.0 10.5 23.6 6.8 7.3 12.1 3.6										28.0 48.9 25.1 23.7 30.3 49.2 .68 2.2 7										28.0 48.9 25.1 23.7 30.3 49.2 .68 2.2 7										
Means ..																														

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.41 a. m., 1.41 p. m., and 9.41 p. m., local time.

Corrections for instrumental error of barometer used: From 7 a. m., January 1, to 3 p. m., August 6, inclusive, +.004 inch; from 7 p. m., August 6, to 11 p. m., December 31, 1884, inclusive, —.009 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.11; February, 1.10; March, 1.08; April, 1.08; May, 0.98; June, 0.97; July, 0.96; August, 0.97; September, 0.99; October, 1.02; November, 1.06; December, 1.11.

REMARKS.—Extra barometer substituted for station barometer August 6; hence change in "instrumental error."

L. M. DEY,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

MOUNT WASHINGTON, N. H.

Location of office on December 31, 1884, Signal office, summit.

[Latitude, 44° 10' N.; longitude, 71° 19' W. Elevation of barometer above sea-level, 6,279 feet. Elevation of exposed thermometer above ground, 6 feet. Elevation of rain-gauge above ground, 2 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.				Wind.				Total movement.
	Washington time.					Monthly mean.					Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.	Maximum hourly velocity during month.	Direction from—	Miles.	Date.	Prevailing direction.					
	7 a. m.	3 p. m.	11 p. m.	Range.	Date.	In.	Lowest.	Date.	In.	Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.															
1884.	In.	n.	In.	n.	In.	In.	In.	In.	In.	Monthly mean.	Maximum.	Minimum.	Date.	Range.	Date.	In.	In.	Date.	Direction from—	Miles.	Date.	Prevailing direction.							
Jan.....	23.384	23.361	23.363	23.370	23.044	27	22.062	2	1.282	4.2	6.8	°	°	°	°	24	23.0	6	65.0	14.5	5.1	1.2	130	NW.					
Feb.....	23.515	23.469	23.483	23.489	23.995	16	22.468	29	1.527	14.5	15.7	12.1	14.1	39.0	14	30.2	29	09.2	23.5	2.1	7.53	1.93	13	14	130	SE.			
Mar.....	23.415	23.432	23.433	23.443	23.801	18	22.854	1	1.067	11.1	14.0	11.4	12.2	24.6	12	26.0	1	61.6	19.8	2.5	4.16	1.26	12	122	SW.				
Apr.....	23.481	23.495	23.496	23.493	23.890	27	22.778	4	1.111	23.9	27.5	24.7	25.4	45.2	27	1.8	1	43.4	30.6	18.1	3.29	7.72	15	16	92	NW.			
May.....	23.645	23.656	23.662	23.654	24.084	22	23.154	11	.930	30.3	34.5	31.1	32.0	55.0	26	12.5	23	42.5	38.0	25.4	9.54	2.95	20	21	100	W.			
June.....	23.980	23.971	23.966	23.972	24.274	15	23.853	24	.621	46.8	53.0	47.2	49.0	67.0	17	26.5	14	40.5	55.8	42.1	8.08	2.86	9	10	74	NW.			
July.....	23.730	23.721	23.710	23.720	24.049	4	23.399	14	.650	43.2	47.3	43.3	44.6	68.8	1	30.0	25	36.8	50.1	39.3	23.90	4.94	14	15	96	NW.			
Aug.....	23.908	23.936	23.951	23.959	24.167	16	23.662	1	.505	45.2	51.1	46.9	47.7	65.0	19	21.6	25	43.4	53.8	41.5	8.63	2.70	29	30	88	SE.			
Sept.....	23.883	23.878	23.873	23.878	24.181	26	23.493	16	.688	39.6	43.6	41.0	41.4	63.0	4	13.5	14	49.5	46.6	34.6	7.58	1.14	7	8	96	NW.			
Oct.....	23.735	23.720	23.728	23.728	24.096	26	23.360	17	.746	27.2	30.1	27.9	28.4	56.4	4.5	4	26	52.1	36.2	20.9	12.91	3.95	4	92	NW.				
Nov.....	23.509	23.516	23.512	23.512	23.970	22	23.950	24	1.020	15.8	17.6	16.9	16.8	97.1	5	8.9	25	46.0	24.4	8.4	7.99	3.30	23	24	128	S.			
Dec.....	23.509	23.509	23.499	23.506	24.131	29	22.944	7	1.107	10.2	12.7	12.7	11.9	94.0	31	42.2	19	85.2	21.2	4.2	4.70	.91	30	96	NW.				
Sums.....	283.784	283.687	283.701	283.722	283.722	283.722	283.722	283.722	283.722	283.722	283.722	283.722	283.722	283.722	283.722	283.722	283.722	283.722	283.722	283.722	283.722	283.722	283.722	283.722	283.722	283.722			
Means.....	23.649	23.641	23.642	23.644	24.274	15	23.644	24.274	15	23.644	24.274	15	23.644	24.274	15	23.644	24.274	15	23.644	24.274	15	23.644	24.274	15	23.644	24.274			

† June. ‡ February. § December.

\* Insufficient, owing to frost-work, &c.

\* Insufficient, owing to frost-work, &c.

† June.

‡ February.

§ December.



## MOUNT WASHINGTON, N. H.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—							Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Washington time.				Mean.				Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7:23 a. m., 8:23 p. m., and 11:23 p. m., local time. Corrections for instrumental error of barometer used: From 7:23 a. m., January 1, to 3:23 p. m. June 13, inclusive, + .009 inch; from 7:23 p. m., June 13, 1884, to 11:23 p. m., December 31, 1884, inclusive, — .003 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 6.630; February, 6.629; March, 6.520; April, 6.410; May, 6.180; June, 6.130; July, 6.070; August, 6.080; September, 6.150; October, 6.340; November, 6.560; December, —6.630.

REMARKS.—Station barometer No. 1857 broken June 13; extra barometer No. 505 substituted and the first observation taken with it was the 7:23 p. m. (local time) June 13; frosts occurred during each month of the year. The year has been noted for the grandeur of its sunrises and sunsets; all the characteristics which have lately attracted such universal attention have been observed here. On nearly all clear days the copper-colored band around the sun has also been observed.

EDWARD A. BEALS,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

MYER, FORT, VA.

[Latitude, 38° 59' N.; longitude 77° W. Elevation of barometer above sea-level, 207 feet. Elevation of exposed thermometer above ground, 42.97 feet. Elevation of rain-gauge above ground, 1.17 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.					Precipitation.		Wind.			Total movement.								
Washington time.		Monthly mean.			Lowest.		Date.		Range.		Washington time.			Self-registering thermometer.		Mean maximum.		Mean minimum.			Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.		
7 p.m.	3 p.m.	11 p.m.	In.	In.	In.	In.	Date.	Range.	7 p.m.	3 p.m.	11 p.m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Maximum.	Minimum.		Total amount.	Amount.	Date.	Miles.	Direction.		Date.	
1884.																												
29.915	29.860	29.871	29.887	30.006	27.28.945	28.1.661	8	2.0	6	28.0	8	28.0	51.0	8	7.8	29.63.7	43.2	30.9	6.13	1.11	23.43	8	34	NW.	9	NW.	7.187	
29.817	29.792	29.871	29.827	30.468	29.20.064	29.404	28	44.4	33.8	39.8	39.8	71.5	6	7.8	29.63.7	43.2	30.9	6.13	1.11	23.43	23	43	NW.	20	NW.	70.238		
29.795	29.733	29.792	29.773	30.184	29.28.241	29.943	26	36.2	46.3	39.8	40.8	65.0	12	10.3	1	54.7	49.0	33.2	7.52	1.75	19.44	9	41	NW.	30	NW.	7.945	
29.660	29.593	29.655	29.698	29.967	29.28.939	2	1.028	44.0	56.1	48.1	49.4	80.2	28	49.0	5	49.7	58.3	41.8	2.29	.97	9	41	NW.	15	NW.	8.253		
29.728	29.670	29.712	29.703	30.063	3	29.401	11	.662	57.3	69.9	68.9	62.4	87.8	23	38.3	29	49.5	72.2	52.8	.64	5	6	30	NW.	14	NW.	0.600	
29.832	29.790	29.801	29.808	30.209	15	29.419	25	.760	64.9	77.9	68.2	70.3	91.8	21	46.6	16	45.2	80.6	60.9	5.88	2.89	13.14	26	NW.	26	NW.	5.291	
29.656	29.566	29.630	29.627	29.816	22	29.396	29	.420	67.2	78.9	69.7	71.9	95.2	24	54.9	9	40.3	81.7	63.7	6.02	1.99	28	30	NW.	24	NW.	5.618	
29.813	29.771	29.794	29.774	30.040	25	29.453	30	.897	67.7	79.8	69.9	72.5	94.8	20	56.0	13	38.8	81.6	64.4	.69	.28	30.31	32	NW.	21	NW.	5.907	
29.861	29.831	29.840	29.854	30.223	14	29.505	17	.716	62.6	79.6	67.6	68.9	94.6	9	43.0	15	61.6	81.8	63.4	.89	.40	12	26	NW.	24	NW.	4.841	
29.803	29.838	29.901	29.896	30.357	29.28.478	8	.879	52.3	67.4	54.0	58.6	93.6	4	31.0	24	59.6	69.7	58.2	1.61	.68	22	32	SW.	22	NW.	6.399		
29.863	29.810	29.834	29.826	30.178	3	29.276	28	.952	37.9	57.0	42.4	43.7	72.7	2	20.5	26	82.2	54.8	33.5	3.03	1.74	23	36	S.	22	NW.	6.635	
29.942	29.881	29.914	29.912	30.412	28	29.255	6	1.147	80.4	89.3	84.4	83.7	96.1	31	3.7	19	64.4	42.8	27.7	4.50	1.68	6	43	NW.	9	NW.	6.941	
Sums.																												
357.832	357.175	357.655	357.553			11.191	581.0	722.4	622.6	642.1		8.0		617.7	737.3	538.4	48.24										NW.	76,278
29.819	29.765	29.805	29.796			.953	48.4	60.2	51.9	53.5	95.2	724			61.5	68.1	44.7										NW.	.....
Means.																												

July.

April.

January.

For 20 days.

For 30 days.

For 35 days.

For 27 days.

MYER, FORT, V. A.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—								Dew-point.	Relative humidity (per cent.).	Washington time.					Cloudiness (in tenths).					Number of days—								
	Number of calm.																												
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.			7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	(In which .01 inch or more precipitation fell.)	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.		
1884.																													
Jan.....	7	12	8	2	4	19	8	26	10	20.5	23.8	23.2	23.2	22.5	87.1	74.2	82.3	81.3	6.1	4.8	4	16	11	13	7	27	0	0	0
Feb.....	6	12	9	10	7	9	4	19	11	32.2	32.7	32.4	32.5	32.5	84.5	66.6	80.7	75.5	5.0	4.0	4	15	10	16	1	15	0	0	0
Mar.....	1	5	11	14	7	2	7	37	9	31.6	33.5	32.6	32.5	32.5	84.5	61.6	76.6	73.3	6.0	5.0	6	15	10	19	3	13	0	1	0
Apr.....	4	9	4	17	6	8	4	39	10	34.8	34.6	35.9	35.4	35.4	71.8	49.6	67.1	62.8	5.1	6.0	6	15	10	19	3	13	0	1	0
May.....	5	5	9	10	12	10	24	8	49	49.6	50.0	51.0	50.3	50.3	77.9	52.4	74.3	68.9	4.1	4.5	11	11	10	14	0	23	0	3	0
June.....	1	12	16	11	7	4	12	11	60.2	61.5	62.1	61.3	61.3	61.3	83.0	59.7	81.1	73.3	3.3	4.0	10	13	7	13	0	0	0	3	0
July.....	5	2	6	3	10	18	10	20	7	61.9	63.8	64.8	62.6	62.6	84.0	61.4	80.1	77.8	4.0	4.5	10	13	4	13	0	0	0	2	0
Aug.....	7	2	6	6	10	8	9	22	4	67.1	67.8	68.8	66.4	66.4	88.5	60.4	84.5	69.6	3.0	4.0	6	23	4	12	0	0	0	2	0
Sept.....	7	6	3	6	19	27	7	23	9	57.8	57.8	58.8	53.1	53.1	88.0	49.0	74.8	69.6	2.5	3.0	17	10	3	0	0	0	0	0	0
Oct.....	14	6	5	0	16	14	7	23	9	46.7	46.9	47.2	43.9	43.9	81.7	51.9	73.8	68.0	2.4	2.7	16	10	7	8	0	13	0	1	0
Nov.....	12	5	4	3	12	14	10	23	2	32.1	32.5	33.1	32.5	32.5	80.5	53.2	71.9	68.4	4.0	3.5	15	16	7	9	0	0	0	0	0
Dec.....	15	5	4	0	11	9	3	29	11	26.2	26.8	27.7	27.7	27.7	83.5	69.5	73.1	73.0	3.7	7.3	7	11	13	9	0	20	0	0	0
Sumas..	84	81	82	83	123	145	78	298	128	518.7	530.2	532.7	523.8	523.8	903.8	712.1	926.0	873.9	50.2	64.3	93	156	98	122	18	91	14	17	1
Percentages.																													
Means.	7.7	7.4	7.5	7.6	11.4	13.2	6.8	27.2	11.2	43.2	44.1	44.4	43.9	43.9	83.3	59.3	77.2	73.3	4.9	5.4	30.6	42.6	26.8	83.3	4.9	24.9	3.8	4.6	3

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7 a. m., 3 p. m., and 11 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, + .003 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.300; February, 0.300; March, 0.300; April, 0.290; May, 0.280; June, 0.280; July, 0.280; August, 0.280; September, 0.280; October, 0.280; November, 0.300; December, 0.300.

GEO. HEATHCOTE,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

**NASHVILLE, TENN.**

**Location of office on December 31, 1884, Barns' Block, Public Square and North Market street.**

[Latitude, 30° 30' N.; longitude, 80° 47' W. Elevation of barometer above sea-level, 549 feet. Elevation of exposed thermometer above ground, 61 feet. Elevation of rain-gauge above ground, 79 feet.]

[illegible]

## NASHVILLE, TENN.—Continued.

[illegible]

\* See L. R.

NOTE.—7 a. m., 3. p. m., and 11 p. m., Washington time, correspond to 6.21 a. m., 2.21 p. m., and 10.21 p. m., local time.

NOTE. — 1 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.21 a. m., 2.21 p. m., and 10.21 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m. January 1, to 11 p. m., December 31, 1884 inclusive, + .007 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.610; February, 0.610; March, 0.600; April, 0.580; May, 0.570; June, 0.560; July, 0.560; August, 0.560; September, 0.570; October, 0.580; November, 0.600; December, 0.610.

Corrections for instrumental error of barometer used: 2.00 in. January 21 to 23 p.m.; December 24, 1887, inclusive, 1.00 in.

**REMARKS.** January, 9th; 0200 hours; 8 knots; light fog; ocean 20 ft.; pink sunset gloves on 12th, 20th, 21st, and 29th. Feb. 6th; 0700 hours; 12 knots; light fog; 13 inches snow on 7th; March wind-storms with heavy snow for five minutes, afternoon of 1st; pink sunset gloves, 24th and 25th; planting much retarded; river above danger-line, 9th to 20th; last snow 25th; April, last ice, 9th; last frost, 25th; pink sunset gloves, 15th, 25th, 27th, 29th, and 30th; cold weather retards planting. May, pink sunset gloves, 9th; hail-storm, 4th. June, pink sunset gloves, 15th, 18th, 19th, 20th, 21st, 22nd, 23rd, 24th, 25th, 26th, 27th, 28th, 29th, and 30th; first frost of season, 16th, light; first hail, 23d, 28d. August, pink sunset gloves, 2d, 4th, 6th, 12th, 13th, 14th, 15th, 18th, 19th, 21st, 31st; river below zero of gauge, 20th and 28th; no thunder-storms. November, first week of season, 28th; no thunder-storms. December, normal temperature; sleet, 17th and 27th; pink sunset gloves, 2d, 3d, 4th, 8th, 10th, 19th, 22d, pink sunset gloves, 2d, 3d, 4th, 7th, 16th, 19th, 22d, 30th; very ice steamboat season; no electric manifestations during month.

L. N. JESUNOFSKY, *Sergeant, Signal Corps U. S. A.*

*Meteorological summary for the year ending December 31, 1884—Continued.*

NEW HAVEN, CONN.

Location of office on December 31, 1884, Insurance Building, No. 370 Chapel street.

[Latitude, 41° 18' N.; longitude, 72° 50' E. Elevation of barometer above sea-level, 107 feet. Elevation of exposed thermometer above ground, 112 feet. Elevation of rain-gauge above ground, 109 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).						Temperature.										Precipitation.				Wind.				Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	Washington time.			Monthly mean.			Washington time.			Self-registering thermometers.				Mean minimum.			Mean maximum.			Any 3 consecutive 8-hourly measurements.			Maximum hourly velocity during month.			Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	7 a. m.	3 p. m.	11 p. m.	In.	Th.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
1884.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.

\* January.

† February.

‡ June.

§ December.

## NEW HAVEN, CONN.—Continued.

Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from —										Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days —																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
North.		Northeast.		East.		Southeast.		South.		Southwest.		West.		Northwest.		Number of calms.		Washington time.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
																		7 a. m.		8 p. m.		11 p. m.		Mean.		7 a. m.		8 p. m.		11 p. m.		Mean.		Clear.		Rain.		Cloudy.		On which .01 inch or more precipitation fell.		Maximum below 32°.		Minimum below 32°.		Maximum above 90°.		Thunder-storms.		Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond to 7 1/2 a. m., 8 1/2 p. m., and 11 1/2 p. m., local time.  
 Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, + .007 inch.  
 The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.120; February, 0.120; March, 0.120; April,  
 0.120; May, 0.120; June, 0.110; July, 0.110; August, 0.110; September, 0.110; October, 0.120; November, 0.120; December, 0.120.

J. H. SHEPHERD  
 Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

NEW LONDON, CONN.

Location of office on December 31, 1884, United States custom-house.

[Latitude 41° 21' N.; longitude, 73° 9' W. Elevation of barometer above sea-level, 47 feet. Elevation of exposed thermometer above ground, 29 feet. Elevation of rain-gauge above ground, 63 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.								Precipitation.			Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	Washington time.			Monthly mean.	Hi-ghest.	Date.	Low-est.	Date.	Range.	Washington time.			Self-registering ther-mometers.				Mean maximum.	Mean minimum.	Total amount.	Any 3 con-secutive hourly measure-ments.			Maximum hourly velocity during month.			Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	7 P. M.	3 P. M.	11 P. M.							7 A. M.	3 P. M.	11 P. M.	Monthly mean.	Maximum.	Date.	Minimum.				Date.	Absolute range.	Total amount.	Largest amount.	Date.			Miles.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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\* January.

† February.

‡ September.

§ December.



NEW LONDON, CONN.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m. Washington time: Number of times observed blowing from—								Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—									
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.				Washington time.				Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.					
									7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.										7 a. m.	8 p. m.	11 p. m.	Mean.	
1884.																														
Jan.....	18	16	2	6	3	12	8	20	0	10.6	21.6	13.2	19.1	77.1	73.5	76.3	75.6	5.2	6.2	2.5	5.0	0	0	0						
Feb.....	9	14	10	5	3	12	8	20	3	23.6	31.2	24.2	23.7	87.8	81.2	78.7	82.9	7.2	6.4	4.3	4.6	0	0							
Mar.....	10	8	5	3	6	8	17	30	7	28.9	37.4	29.2	23.9	81.2	73.0	76.5	77.7	6.6	6.4	4.3	5.4	1	1							
Apr.....	14	11	7	2	7	12	18	13	5	33.8	46.0	44.4	45.2	72.0	64.6	70.9	72.4	5.7	6.8	5.5	5.8	0	0							
May.....	2	9	5	7	12	22	18	13	5	43.3	58.0	53.2	56.9	78.2	68.1	81.3	75.9	4.7	4.9	3.0	4.2	0	0							
June.....	6	12	5	10	9	34	0	5	9	57.5	68.0	60.8	61.0	81.0	76.7	87.4	81.4	3.2	2.7	2.3	2.7	0	0							
July.....	11	5	2	5	14	23	6	3	9	59.9	62.4	60.8	61.4	89.4	83.2	89.6	87.4	4.3	4.8	4.5	4.1	0	0							
Aug.....	17	8	0	3	26	21	8	3	12	63.6	66.7	62.9	64.4	89.4	83.2	89.6	87.4	5.2	5.7	4.5	4.1	0	0							
Sept.....	11	3	1	7	36	7	10	7	10	58.4	60.0	59.4	59.3	86.3	80.8	87.0	84.2	2.4	2.3	3.0	2.6	0	0							
Oct.....	20	7	3	0	7	26	13	12	5	47.6	52.8	49.1	49.8	86.3	80.8	87.0	84.2	4.3	4.8	4.6	4.1	0	0							
Nov.....	9	4	3	3	8	19	27	17	0	33.9	36.8	36.2	35.6	84.0	77.3	83.9	76.3	5.1	5.2	3.7	4.3	0	0							
Dec.....	19	14	0	1	8	22	12	14	3	27.2	30.4	29.9	29.2	84.0	77.3	83.9	81.7	5.7	5.2	5.1	5.3	0	0							
Sums..	146	131	45	44	117	234	165	106	70	501.3	634.0	508.2	514.4	975.6	878.3	981.3	945.1	58.6	59.8	48.8	55.7	133	143	90	161	27	96	0	16	3
Means	Percentages.																							Percentages.						
	13.3	10.1	4.1	4.0	10.7	21.3	15.0	11.6	6.4	41.8	44.5	42.4	42.9	81.3	73.2	81.8	78.8	4.9	5.0	4.1	4.7	36.3	39.1	24.6	44.0	7.4	26.2	0.4	4.0	8

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.30 a. m., 3.20 p. m., and 11.20 p. m., local time.

Correction for instrumental error of barometer used: From 7.20 a. m., January 1, to 11.20 p. m., December 31, 1884, inclusive, +.005 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.050; February, 0.050; March, 0.050; April, 0.050; May, 0.050; June, 0.050; July, 0.050; August, 0.050; September, 0.050; October, 0.050; November, 0.050; December, 0.050.

REMARKS.—January, the most destructive gale for years occurred on the 29th; February, severe storms on the 1st, 20th, 23d, and 24th; March, gales on the 18th, 26th, and 30th; April, very mild weather after first week; May, unusual displays of sheet-lightning on the 22d, 23d, and 24th; June, last frost of the season on the 15th, mirage 23d, very heavy rain 25th and 26th; July, remarkably low barometer and very small range; August, earthquake on the 10th, at 2.12 p. m.; September, highest temperature of the year on the 10th, very dry month; October, first light frost on the 10th, first killing frost 16th, mirage 15th; November, first snow 19th, remarkable meteor 5th, very severe gale 23d and 24th; December, extremes of temperature, lowest of the year on the 26th, dangerous gales, large rainfall.

JNO. G. LYNCH,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

NEW ORLEANS, LA.

Location of office on December 31, 1884, United States custom-house.

[Latitude, 29° 59' N.; longitude, 90° 4' W. Elevation of barometer above sea-level, 53 feet. Elevation of exposed thermometer above ground, 45 feet. Elevation of rain gauge above ground, 84 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.		Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	Washington time.					Monthly mean.					Washington time.		Self-registering thermometers.				Any 3 consecutive 6-hourly measurements.	Date.	Direction from —	Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	7 p. m.		8 p. m.		11 p. m.		Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.						Miles.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	In.	W.	In.	W.	In.	W.																	In.	W.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
1884.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	

January.

April.

July.

NEW ORLEANS, LA.—Continued.

[illegible]

NCTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.08 a. m., 2.08 p. m., and 10.08 p. m., local time.

**† December.**

**M. HERMAN,**  
*Sergeant, Signal Corps, U. S. A.*

*Meteorological summary for the year ending December 31, 1884—Continued.*

NEW YORK CITY.

Location of office on December 31, 1884, Equitable building.

[Latitude, 40° 42' N.; longitude, 74° 0' W. Elevation of barometer above sea-level, 104 feet. Elevation of exposed thermometer above ground, 145 feet. Elevation of rain-gauge above ground, 145 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).						Temperature.						Precipitation.				Wind.							
	Washington time.			Monthly mean.			Washington time.			Self-registering thermometers.			Any consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.		Total movement.					
	7 a. m.	3 p. m.	11 p. m.	In.	Th.	W.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	In.	Th.	W.	Miles.	Direction.	
1884.																								
Jan .....	29.862	29.825	29.855	29.855	29.854	29.854	29.861	29.825	29.855	29.854	29.854	27	29.861	27	29.861	1.728	29.825	29.855	1.728	29.825	29.855	29.854	SW.	6,203
Feb .....	29.865	29.886	29.842	29.842	29.842	29.842	29.861	29.842	29.842	29.842	29.842	16	29.861	16	29.861	1.528	29.842	29.861	1.528	29.842	29.861	29.842	SW.	6,610
Mar .....	29.873	29.869	29.869	29.869	29.869	29.869	29.873	29.869	29.869	29.869	29.869	28	29.873	28	29.873	1.540	29.869	29.873	1.540	29.869	29.873	29.869	SW.	6,305
Apr .....	29.899	29.893	29.893	29.893	29.893	29.893	29.899	29.893	29.893	29.893	29.893	22	29.899	22	29.899	1.539	29.893	29.899	1.539	29.893	29.899	29.893	SW.	6,910
May .....	29.908	29.908	29.908	29.908	29.908	29.908	29.908	29.908	29.908	29.908	29.908	11	29.908	11	29.908	1.539	29.908	29.908	1.539	29.908	29.908	29.908	SW.	6,164
June .....	29.940	29.902	29.921	29.921	29.921	29.921	29.940	29.902	29.921	29.921	29.921	13	29.940	13	29.940	1.506	29.902	29.940	1.506	29.902	29.940	29.921	SW.	7,131
July .....	29.920	29.897	29.907	29.907	29.907	29.907	29.920	29.897	29.907	29.907	29.907	30	29.920	30	29.920	1.506	29.897	29.920	1.506	29.897	29.920	29.907	SW.	6,852
Aug .....	29.907	29.872	29.897	29.897	29.897	29.897	29.907	29.872	29.897	29.897	29.897	10	29.907	10	29.907	1.506	29.872	29.907	1.506	29.872	29.907	29.897	SW.	6,203
Sept .....	29.906	29.910	29.917	29.917	29.917	29.917	29.906	29.910	29.917	29.917	29.917	8	29.906	8	29.906	1.506	29.910	29.906	1.506	29.910	29.917	29.917	SW.	6,644
Oct .....	29.914	29.878	29.899	29.899	29.899	29.899	29.914	29.878	29.899	29.899	29.899	15	29.914	15	29.914	1.506	29.878	29.914	1.506	29.878	29.899	29.899	SW.	8,231
Nov .....	29.909	29.897	29.914	29.914	29.914	29.914	29.909	29.897	29.914	29.914	29.914	31	29.909	31	29.909	1.506	29.897	29.909	1.506	29.897	29.914	29.914	SW.	8,419
Dec .....	29.909	29.897	29.914	29.914	29.914	29.914	29.909	29.897	29.914	29.914	29.914	31	29.909	31	29.909	1.506	29.897	29.909	1.506	29.897	29.914	29.914	SW.	8,419
Sums ..	358,709	358,118	358,549	358,549	358,549	358,549	358,709	358,118	358,549	358,549	358,549	21	358,709	21	358,709	545.8	358,118	358,549	545.8	358,118	358,549	358,549	70,275	W.
Means ..	29.892	29.843	29.879	29.879	29.879	29.879	29.892	29.843	29.879	29.879	29.879	21	29.892	21	29.892	1.220	29.843	29.879	1.220	29.843	29.879	29.879	W.	.....

• December.

• September.

• August.

• June.

• April.

• January.

## NEW YORK CITY—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.	Relative humidity (per cent.).			Cloudiness (in tenths).			Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	Number of calm.									Washington time.			Mean.			Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.										11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.12 a. m., 3.12 p. m., and 11.12 p. m., local time. Correction for instrumental error of barometer used: From 7.12 a. m., January 1, to 11.12 p. m., December 31, 1884, inclusive, +.009 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.190; February, 0.190; March, 0.180; April, 0.180; May, 0.180; June, 0.170; July, 0.170; August, 0.170; September, 0.170; October, 0.180; November, 0.180; December, 0.180.

W. W. EICHELBERGER,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

NORFOLK, VA.

Location of office on December 31, 1884, Dalton building, corner Main street, Roanoke avenue.

[Latitude, 36° 51' N.; longitude, 76° 17' W. Elevation of barometer above sea-level, 30 feet. Elevation of exposed thermometer above ground, 30 feet. Elevation of rain-gauge above ground, 53 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.			Total movement																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	Washington time.					Monthly mean.					Range.					Self-registering thermometer.					Any consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	7 P. M.			11 P. M.		In.	Date.	Lowest.	Date.	In.	Date.	Highest.	Date.	Lowest.	Date.	Range.	7 P. M.	11 P. M.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.			Mean maximum.	Mean minimum.	Total amount.	Date.	Direction.	Miles.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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1884.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.	Th.	W.	In.</

\* January.

† April.

‡ July.

## NORFOLK, VA.—Continued.

Month.	Wind at 7 a. m., 3 and 11 p. m., Washington time; Number of times observed blowing from—										Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—								River.															
																	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Highest.	Date.	Lowest.	Date.	Range.	Mean.										
	North.	Northeast.	East.	Southeast.	South.	Southeast.	West.	Northwest.	Number of calm.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.															Mean.									
1884.	Jan....	Feb....	Mar....	Apr....	May....	June....	July....	Aug....	Sept....	Oct....	Nov....	Dec....	Sums.	Means.	Percentages.																									
	31	12	2	3	6	23	11	2	3	23.9	26.7	30.1	23.6	78.2	63.4	72.8	71.8	6.7	6.0	5.4	6.0	8	10	13	15	3	20	0	0	17	6	11	3	0	16	3				
	14	10	9	1	15	17	4	9	11	42.9	43.2	41.4	42.5	85.5	67.0	76.4	76.4	6.1	6.1	5.8	5.8	6	12	11	15	1	5	0	1	18	6	18	15	0	16	9				
	14	8	6	10	11	7	3	17	17	40.1	42.8	41.9	41.4	79.4	65.3	77.1	73.9	4.8	6.3	4.0	5.9	8	15	8	17	0	4	0	1	18	0	30	15	0	10	11	12			
	9	21	7	11	8	5	7	18	9	42.8	41.4	42.8	42.8	72.7	53.4	71.6	67.1	5.7	5.9	3.6	5.1	10	13	9	8	0	4	0	1	19	0	30	15	0	10	11	10			
	8	16	7	10	17	12	7	3	13	54.2	54.0	54.1	55.4	75.5	50.9	74.9	67.2	4.8	4.8	3.6	4.4	11	14	6	7	0	4	0	1	19	6	29	15	0	10	11	4			
	6	20	7	12	16	20	4	3	2	64.3	63.4	63.9	63.9	80.6	63.1	80.5	74.7	4.9	4.9	3.8	4.4	10	10	10	11	0	0	0	3	1	19	6	29	15	0	10	11	4		
	10	9	3	5	16	31	9	8	2	67.7	68.5	68.3	68.3	80.5	62.5	82.6	75.2	6.1	4.4	3.1	4.5	10	18	8	13	0	0	0	3	1	18	6	27, 28	14	6	21	4	0	16	5
	9	29	15	2	14	17	2	8	3	68.7	68.2	68.5	68.5	84.0	64.1	80.1	72.7	2.7	3.1	1.2	2.3	20	8	2	2	0	0	0	3	0	19	0	13	14	6	21	4	0	16	5
	16	19	11	8	11	17	3	6	2	53.6	55.2	55.3	54.7	81.0	57.7	75.3	72.4	3.1	3.9	2.3	3.1	17	13	1	4	0	0	0	3	0	18	3	12, 26	14	6	21	4	0	16	5
	18	17	7	9	19	22	0	2	8	64.2	62.8	64.2	63.7	84.0	64.1	80.1	72.7	2.7	3.1	1.2	2.3	20	8	2	2	0	0	0	3	0	19	0	13	14	6	21	4	0	16	5
	16	19	11	8	11	17	3	6	2	53.6	55.2	55.3	54.7	81.0	57.7	75.3	72.4	3.1	3.9	2.3	3.1	17	13	1	4	0	0	0	3	0	19	0	13	14	6	21	4	0	16	5
	29	15	3	3	6	8	10	15	2	41.9	43.0	44.2	43.0	81.7	58.1	75.3	72.0	3.8	4.1	4.8	4.1	15	7	8	7	0	0	0	3	0	19	0	24	14	9	24	4	3	17	0
	29	15	3	3	12	17	6	8	6	35.9	38.0	38.5	37.8	81.4	68.8	76.2	76.8	5.7	7.2	5.4	6.1	4	15	12	16	2	4	0	0	19	0	25	14	3	29	4	9	16	6	
	170	196	83	77	146	196	66	93	72	647.2	610.7	615.2	611.0	868.5	732.3	833.5	878.1	106.4	463.4	444.4	464.7	120	139	98	125	6	36	10	8	.....	47	3	199	9	.....	47	3	199	9	
	Percentages.										Percentages.										Percentages.																			
	15.5 17.9 7.5 7.0 13.3 17.9 9.0 8.5 6										50.6 50.9 51.3 50.9 80.6 61.1 77.9 73.2 5.9 5.3 3.9 4.7										35.3 38.3 26.8 34.2 1.5 8.2 7.2 2										19 6									
																															14 3									
																															117, 192									
																															3 11.2									
																															16 7 8									

; December.

; September.

\* May.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7:03 a. m., 3:03 p. m., and 11:03 p. m., local time.

Correction for instrumental error of barometer used: From 7:43 a. m., January 1, to 11:03 p. m., December 31, 1884, inclusive, + 0.02 inch.

The barometric observations have been reduced to sea level by adding the following constants for the month: January, 0.003; February, 0.003; March, 0.030; April, 0.030; May, 0.030; June, 0.030; July, 0.030; August, 0.030; September, 0.030; October, 0.030; November, 0.030; December, 0.030.

JAMES P. SHERRY.

Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

NORTH PLATTE, NEBR.

Location of office on December 31, 1884, southwest corner Fifth and Spruce streets.

[Latitude, 41° 8' N.; longitude, 100° 45' W. Elevation of barometer above sea-level, 2,841 feet. Elevation of exposed thermometer above ground, 21 feet. Elevation of rain-gauge above ground, 34 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.			Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	Washington time.					Monthly mean.	Washington time.					Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.	Maximum hourly velocity during month.		Prevailing direction.	Miles.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Range.		Date.	Lowest.	Highest.	Date.	Lowest.	Highest.	Date.	Minimum.	Date.	Abolition range.					Date.	Minimum.			Date.	Maximum.	Date.	Miles.	Direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In

\* One 7 a. m. observation taken late.

† January.

‡ March.

§ July.

|| February.



## NORTH PLATTE, NEBR.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from.—								Dew-point.			Relative humidity (per cent.).			Cloudiness (in tenths).		Number of days—															
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.			Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.			
Washington time.																																
1884.																																
Jan.....	2	5	1	8	4	0	40	12	20	7.9	16.8	12.2	12.1	79.9	65.3	77.6	74.3	3.2	3.4	3.5	13	15	10	4	12	20	0	0	0	0	0	0
Feb.....	9	14	12	9	1	6	14	24	20	8.4	14.6	12.3	11.8	76.7	61.7	79.1	72.5	4.0	4.0	4.8	11	10	6	3	15	27	0	0	0	0	0	0
Mar.....	9	10	10	10	4	1	8	19	16	22.2	29.4	27.9	26.5	80.1	68.5	79.8	75.5	5.3	4.9	5.7	6	16	0	9	12	0	0	0	0	0	0	0
Apr.....	18	5	10	17	5	4	6	17	8	31.3	35.0	35.8	34.0	80.2	87.0	77.2	69.1	6.6	5.5	5.7	5	10	0	9	12	0	0	0	0	0	0	0
May.....	7	3	18	18	10	4	11	14	8	44.3	45.8	48.0	46.4	80.7	56.9	74.7	68.8	5.2	3.1	3.9	11	17	0	9	12	0	0	0	0	0	0	0
June.....	2	4	16	37	11	3	5	7	7	57.6	60.1	61.2	59.6	84.0	51.9	75.2	70.4	4.1	2.9	4.1	13	17	0	9	12	0	0	0	0	0	0	0
July.....	8	10	19	24	13	0	9	7	7	60.7	63.2	63.8	62.3	85.0	53.5	74.1	70.9	4.4	4.4	5.4	7	19	0	9	12	0	0	0	0	0	0	0
Aug.....	7	6	8	23	13	2	7	13	4	55.4	59.2	58.8	57.8	85.4	55.8	75.3	72.2	3.6	3.1	4.0	14	15	1	1	11	0	0	0	0	0	0	0
Sept.....	11	2	14	13	15	2	8	12	7	49.1	50.1	52.2	50.5	80.0	43.2	67.3	63.5	2.8	2.6	4.2	14	15	0	0	11	0	0	0	0	0	0	0
Oct.....	10	4	8	11	4	8	12	9	37	4	43.9	43.6	41.3	75.8	48.0	68.9	64.8	4.2	4.0	4.7	12	14	0	0	12	0	0	0	0	0	0	0
Nov.....	9	6	7	6	5	12	23	14	14	20.5	29.6	27.0	25.7	73.4	49.5	72.0	65.6	2.6	2.9	3.4	9	16	9	4	2	26	0	0	0	0	0	0
Dec.....	17	2	7	13	5	3	10	13	13	5.1	11.2	8.0	8.1	74.6	64.9	75.4	71.6	6.0	6.5	6.0	11	12	13	12	20	31	0	0	0	0	0	0
Sums ..	106	64	120	207	102	41	156	173	129	399.9	433.4	449.8	438.0	854.8	668.5	802.6	833.7	56.2	45.2	54.3	131	170	64	102	53	151	10	9	...	...	...	
Percentages.																																
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Means .	2.7	5.8	10.9	18.9	9.8	3.7	14.2	15.7	11.6	83.8	88.2	87.5	86.3	79.6	55.7	74.4	69.9	4.5	4.7	4.8	35.9	46.6	17.5	27.9	14.5	41.3	2.7	2.5	0	0	0	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.25 a. m., 1.25 p. m., and 9.25 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, —.010 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 3.120; February, 3.100; March, 3.000; April, 2.960; May, 2.870; June, 2.800; July, 2.800; September, 2.860; October, 2.960; November, 3.080; December, 3.160.

REMARKS.—January, February, March, April, temperature lower than usual; deficiency in rainfall. May, unusually cold; season backward one month. June, marked deficiency in rainfall. July, August, September, October, November, December, the coldest for several years. A very marked deficiency in precipitation throughout year.

E. F. BRADY  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

OLYMPIA, WASH.

Location of office, Fourth street.

[Latitude, 47° 8' N.; longitude, 123° 59' W. Elevation of barometer above sea-level, 86 feet. Elevation of exposed thermometer above ground, 23 feet. Elevation of rain-gauge above ground, 88 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	Washington time.					Washington time.					Self-registering thermometers.						Any 8 consecutive 8-hourly measurements.	Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	7 a. m.			11 p. m.		Monthly mean.	Highest.	Lowest.	Date.	Range.	7 a. m.			11 p. m.				Monthly mean.	Maximum.		Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.						11 p. m.	7 a. m.	3 p. m.	11 p. m.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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\* February.

† December.

‡ August.

## OLYMPIA, WASH.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—								Dew point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—					
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Washington time.				Relative humidity (per cent.).				Cloudiness (in tenths).				On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder storms.	Aurora.
									7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.						
1884.																										
Jan.....	4	1	0	1	23	3	0	1	34.1	34.2	34.2	34.2	34.7	78.9	83.2	82.9	6.9	7.3	10	19	15	0	17	0	0	
Feb.....	11	2	0	0	16	3	0	0	26.2	29.2	30.1	28.5	34.7	75.1	81.4	80.4	6.9	6.7	11	10	14	0	8	0	0	
Mar.....	13	2	0	0	12	3	0	0	32.7	33.1	33.7	33.8	34.7	75.5	82.1	81.1	7.3	4.5	10	10	11	0	9	0	0	
Apr.....	8	1	0	0	17	14	3	4	40.5	45.8	46.0	44.1	37.8	69.7	77.3	78.2	7.3	4.5	10	9	11	0	10	0	0	
May.....	29	3	0	0	12	15	3	3	47.3	47.8	47.9	45.9	38.1	69.7	64.5	71.0	6.8	4.8	11	12	13	0	9	0	0	
June.....	17	0	1	0	0	8	7	4	47.1	51.4	51.5	50.0	39.8	65.7	60.4	75.0	3.9	3.7	12	13	8	0	0	0	0	
July.....	16	4	1	0	14	6	13	6	49.4	53.2	53.2	52.0	39.8	65.7	60.4	75.0	4.4	3.4	16	7	9	0	0	0	0	
Aug.....	24	0	0	0	8	6	5	3	45.2	52.9	55.5	54.0	35.8	57.9	61.3	68.2	3.3	3.1	17	9	6	0	0	0	0	
Sept.....	11	0	0	0	2	13	17	5	46.2	49.2	49.8	48.4	35.7	73.4	79.4	79.0	7.2	4.5	13	12	14	0	0	0	0	
Oct.....	8	3	0	0	1	25	0	2	47.0	45.6	45.6	45.0	35.4	78.6	85.9	83.8	8.0	7.7	12	13	17	0	0	0	0	
Nov.....	7	2	2	1	1	18	6	4	43.0	44.8	43.9	43.9	30.6	85.4	91.1	89.0	8.3	6.8	13	12	17	0	0	0	0	
Dec.....	9	7	2	1	6	18	6	4	28.5	23.0	28.4	28.0	38.0	78.4	83.3	82.6	7.8	7.4	14	14	19	0	19	0	0	
Sums ..	148	32	5	6	184	96	52	31	483.5	522.9	525.0	510.8	1,043.0	862.3	926.0	944.8	61.9	60.6	87	140	139	11	51	2	3	
Percentages.																										
Means .	12.5	2.9	0.5	0.5	16.8	8.7	4.7	2.94	40.3	43.6	43.8	42.6	87.2	71.9	77.2	78.8	6.2	5.8	23.9	38.3	38.0	43.4	8.0	13.9	0.5	0.8

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 8.57 a. m., 11.57 a. m., and 7.57 p. m., local time.

Correction for instrumental error of barometer used: From 3.57 a. m., January 1, to 7.57 p. m., December 31, 1884, inclusive, +0.20 inch.

The barometric observations may be reduced to sea level by adding the following constants for the various months: January, 0.040; February, 0.040; March, 0.040; April, 0.040; May, 0.040; June, 0.040; July, 0.040; August, 0.040; September, 0.040; October, 0.040; November, 0.040; December, 0.040.

REMARKS.—Last frost, May 28; first ice, December 6; first snow, December 13.

JNO. DASCOMB,  
Private, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

OMAHA, NEBR.

Location of office on December 31, 1884, United States custom-house, corner of Fifteenth and Dodge streets.

[Latitude, 41° 10' N.; longitude, 96° 50' W. Elevation of barometer above sea-level, 1,113 feet. Elevation of exposed thermometer above ground, 50 feet. Elevation of rain-gauge above ground, 71 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.			Wind.				Total movement.			
Washington time.			Monthly mean.			Washington time.				Self-registering thermometer.				Any 3 consecutive 8-hourly measurements.			Maximum hourly velocity during month.		Prevailing direction.											
7 p. m.	3 p. m.	11 p. m.	In.	In.	In.	Highest.	Date.	Lowest.	Date.	Range.	7 p. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction.		Date.	Miles.	
1884.																														
29.068	29.005	29.016	29.070	29.585	4	28.382	9	1.208	In.	In.	0	0	0	0	0	0	0	0	0	0	0	0	In.	79.25	6	28	NW	10	7,214	
29.905	28.870	28.897	28.891	29.295	9	28.148	18	1.149	14.1	24.4	19.6	19.455.0	1	-12.1	13	07.1	29.8	8.2	1.42.44	4.588	21	N.	4.588	21	N.	23	N.	7,248		
29.816	29.795	29.804	29.805	29.240	13	27.913	10	1.327	29.6	40.5	35.6	35.307.3	27	-2.6	3	00.9	45.5	26.0	4.911.05	27	28	N.	4.911.05	27	28	N.	27	N.	5,819	
29.780	29.765	29.792	29.779	29.192	20	28.091	26	1.101	42.0	53.1	47.4	47.676.0	17	25.3	8	49.7	56.5	39.2	3.891.50	9	24	N.	3.891.50	9	24	N.	19	N.	4,876	
29.816	29.788	29.800	29.801	29.193	29	28.395	5	7.08	54.6	60.9	60.9	61.682.5	9	34.0	2	44.5	72.8	52.1	1.45.09	17	18	N.	1.45.09	17	18	N.	18	N.	4,945	
29.845	29.824	29.827	29.832	29.096	26	28.548	8	4.80	68.5	76.3	71.0	72.393.4	30	52.8	10	40.6	83.2	63.1	6.111.75	21	22	N.	6.111.75	21	22	N.	25	SE, S.	5,285	
29.788	29.767	29.778	29.776	29.057	20	28.568	4	4.99	68.8	81.7	73.4	74.597.3	8	57.5	5	39.8	85.7	65.1	10.352.31	18	19	N.	10.352.31	18	19	N.	24	SE, S.	5,385	
29.877	29.862	29.856	29.865	29.207	9	28.577	28	6.30	64.2	76.8	69.8	70.388.1	19	53.0	21	35.1	79.5	61.9	7.072.81	12	13	N.	7.072.81	12	13	N.	30	S.	5,644	
29.789	29.751	29.772	29.771	29.196	20	28.308	23	8.28	62.0	76.1	67.7	68.690.0	8	48.6	20	41.4	78.1	59.3	4.911.68	14	30	N.	4.911.68	14	30	N.	19	S.	6,897	
29.925	29.889	29.913	29.909	29.239	23	28.615	31	6.74	51.1	64.6	56.3	57.384.5	8	29.8	23	54.7	68.1	47.5	5.813.78	8	4	N.	5.813.78	8	4	N.	19	S.	7,125	
29.986	29.921	29.938	29.932	29.242	5	28.458	26	8.84	33.5	45.2	39.3	39.363.0	12	2.0	23	61.0	50.6	29.5	.52.30	23	26	NW.	.52.30	23	26	N.	30	N.	5,873	
29.961	29.939	29.975	29.958	29.517	24	28.424	3	1.093	14.5	21.0	16.4	17.354.0	1	-17.0	22	71.0	25.4	9.6	.72.20	23	29	N.	.72.20	23	29	N.	23	N.	6,062	
246.476	246.346	246.363	246.339	29.585	4	27.918	110	10.576	512.4	683.9	575.7	580.4	-32.0	5	54.7	58.5	38.0	653.0701.6	467.6	47.68	.....	.....	.....	.....	.....	.....	.....	.....	72,327	
28.873	28.848	28.864	28.862	29.585	4	27.918	110	10.576	512.4	683.9	575.7	580.4	-32.0	5	54.7	58.5	38.0	653.0701.6	467.6	47.68	.....	.....	.....	.....	.....	.....	.....	.....	72,327	
Means.	28.873	28.848	28.864	28.862	29.585	4	27.918	110	10.576	512.4	683.9	575.7	580.4	-32.0	5	54.7	58.5	38.0	653.0701.6	467.6	47.68	.....	.....	.....	.....	.....	.....	.....	.....	72,327

\* January.

† March.

‡ July.

## OMAHA, NEBR.—Continued.

Month.	Wind at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—								River.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Washington time.				Clear.	Fair.	Cloudy.	On which more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.	Highest.	Date.	Lowest.	Date.	Range.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
									7 a. m.	3 p. m.	11 p. m.	Mean.																7 a. m.	3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
1884.	Number of calms.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Jan.	28	3	1	6	21	13	6	13	2	5.9	11.1	11.5	9.5	73.3	65.4	70.0	69.6	2.6	4.5	2.5	3.9	13	18	5	6	14	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0</

\* For 13 days.

† For 16 days.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.44 a. m., 1.44 p. m., and 9.44 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.007 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.27; February, 1.27; March, 1.25; April, 1.21; May, 1.16; June, 1.14; July, 1.13; August, 1.14; September, 1.17; October, 1.20; November, 1.24; December, 1.29.

REMARKS.—January 5, coldest day on record.

ALEXANDER POLIAK,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

OSWEGO, N. Y.

Location of office on December 31, 1884, United States custom-house.

[Latitude, 43° 30' N.; longitude, 76° 35' W. Elevation of barometer above sea-level, 824 feet. Elevation of exposed thermometer above ground, 74 feet. Elevation of rain-gauge above ground, 83 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.				Precipitation.		Wind.												
Washington time.				Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Total amount.	Any 2 consecutive 3-hourly measurements.	Maximum hourly velocity during month.			Prevailing direction.	Total movement.							
7 p. m.	3 p. m.	11 p. m.	Monthly mean.						Maximum.	Date.	Minimum.	Absolute range.	Mean maximum.	Mean minimum.														
Month.	In.	In.	In.	In.	In.	In.	In.	In.	7 p. m.	3 p. m.	11 p. m.	°	°	°	°	°	°	Miles.	Direction from—	Date.	Miles.	°						
1884.																												
Jan.....	29.723	29.685	29.704	29.707	30.514	27	28.787	9	1.727	20.7	24.0	20.9	21.945.8	31	2.6	26	40.4	20.1	13.5	6.49	1.50	8.9	41	W.	2	S.	8,806	
Feb.....	29.666	29.663	29.683	29.674	30.277	16	28.966	28	1.281	23.2	30.9	27.5	29.251.5	5	6.8	29	44.7	37.8	21.7	2.98	.53	17.18	38	W.	28	S.E.	8,007	
Mar.....	29.660	29.645	29.668	29.658	30.031	18	29.138	26	.896	23.7	33.8	31.4	31.554.0	25	7.5	2	45.5	30.2	23.6	2.81	.53	19.20	32	N.	29	S.E.	7,446	
Apr.....	29.551	29.529	29.515	29.542	30.008	21	28.925	2	1.083	39.0	42.7	41.0	40.978.0	27	29.2	6	48.8	43.5	34.4	.88	.33	15.16	30	N.E.	21	N.W.	6,053	
May.....	29.570	29.555	29.566	29.564	29.312	3	29.222	13	.690	51.2	56.6	52.0	53.932.0	23	37.0	116	46.0	64.4	45.6	2.39	.40	9	33	W.	2	W.	6,845	
June.....	29.745	29.711	29.705	29.720	30.130	15	29.376	24	.763	63.4	69.6	63.8	65.690.2	23	49.3	10	49	77.6	53.1	1.48	.67	11	23	N.E.	25	S.	4,457	
July.....	29.500	29.476	29.489	29.498	29.692	3	29.199	31	.438	62.9	67.4	63.2	64.588.5	1	54.2	285	34.3	74.2	59.1	1.90	.80	4	5	W.	31	W.	5,381	
Aug.....	29.676	29.646	29.659	29.660	29.972	9	29.217	29	.755	64.8	73.3	63.7	67.498.3	21	44.4	25	45.9	77.6	59.4	1.71	1.02	29	20	S.	26	S.	5,683	
Sept.....	29.708	29.674	29.690	29.691	30.136	14	29.302	26	.886	60.8	69.8	63.1	61.491.8	4	40.5	14	61.3	75.8	54.5	1.92	.59	29	30	S.	24	S.	6,610	
Oct.....	29.736	29.712	29.724	29.724	30.225	26	29.278	5	.852	48.0	53.8	48.1	50.280.1	4	25.6	26	54.5	61.9	43.0	3.21	.53	17.18	35	N.W.	25	S.E.	8,612	
Nov.....	29.663	29.627	29.635	29.646	30.035	3	29.017	23	1.018	34.6	39.8	36.4	38.962.3	28	17.5	25	44.8	48.0	30.5	2.09	.49	28	38	W.	24	S.E.	9,720	
Dec.....	29.742	29.710	29.722	29.725	30.354	26	28.962	6	1.392	25.8	29.4	27.4	27.553.4	81	17.5	20	75.9	84.7	20.6	2.61	1.16	6	7	W.	23	S.E.	10,683	
Summs	355,940	355,643	355,820	355,801	.....	.....	.....	.....	11,878	528.5	599.1	542.5	553.4	.....	.....	.....	588.0	593.8	471.0	631.47	.....	.....	.....	.....	.....	.....	.....	88,208
Means	29.662	29.637	29.652	29.650	30.514	27	28.787	9	.990	44.0	49.1	43.2	46.138.3	721	17.5	120	48.0	65.5	53.2	.....	.....	.....	.....	.....	.....	.....	.....	.....

\* January.

† August.

‡ December.

OSWEGO, N. Y.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m.; Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—										
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Washington time.				Clear.		Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunder-storms.	Auroras.		
										7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.									11 p. m.	Mean.
1884.	7	11	4	15	21	12	13	10	0	10.0	12.6	11.7	66.9	63.4	66.9	65.6	0	8	23	24	18	31	0	0	0
Jan.....	7	14	1	10	16	4	12	14	0	21.3	23.0	21.0	74.1	73.1	74.0	74.1	0	3	37	24	8	24	0	0	0
Feb.....	14	11	8	17	10	6	16	15	1	22.9	26.0	24.6	75.1	75.4	75.9	75.9	0	15	12	17	8	20	0	0	0
Mar.....	21	9	4	6	8	5	12	22	3	32.5	32.4	33.9	77.9	69.4	74.0	74.0	0	13	13	11	0	0	0	0	0
Apr.....	9	4	2	19	15	9	25	8	2	44.1	44.7	45.2	77.4	64.5	78.2	74.0	0	13	10	16	0	0	0	0	0
May.....	16	12	3	4	23	6	18	5	3	56.4	55.6	57.3	78.3	63.8	79.9	73.7	0	15	9	6	0	0	0	0	0
June.....	19	4	0	7	18	5	38	11	1	57.0	57.8	57.5	81.9	71.2	82.1	78.4	0	17	8	10	0	0	0	0	1
July.....	10	4	1	18	21	10	17	11	1	57.1	56.6	57.0	78.1	59.4	74.5	70.7	0	15	10	8	0	0	0	0	1
Aug.....	9	4	1	18	22	10	14	10	1	53.2	54.1	54.0	77.1	60.8	73.6	70.5	0	16	6	13	0	0	0	0	3
Sept.....	9	2	1	22	22	10	16	11	0	40.2	41.4	40.7	75.4	65.6	73.1	72.0	0	11	16	16	0	0	0	0	1
Oct.....	5	4	3	20	14	13	19	11	1	27.8	31.5	23.9	74.7	73.0	74.7	74.8	0	4	22	17	2	15	0	0	0
Nov.....	4	4	0	26	23	14	11	11	0	20.7	23.3	22.4	81.5	73.6	81.8	80.6	0	5	24	17	12	22	0	0	0
Dec.....	4	4	0	26	23	14	11	11	0	20.7	23.3	22.4	81.5	73.6	81.8	80.6	0	5	24	17	12	22	0	0	0
Sums ..	120	83	23	191	214	104	211	139	13	443.2	458.4	454.2	452.0	439.2	493.5	485.0	70	123	173	176	46	118	4	22	7
Percentages.																									
Means.																									
10.9 7.6 2.1 17.7 19.5 9.5 19.2 12.7 1.2 36.9 38.2 37.8 37.6 36.3 76.1 73.8 6.4 19.1 33.6 47.3 43.1 32.2 1.1 16.0 1.9																									
Percentages.																									
10.9 7.6 2.1 17.7 19.5 9.5 19.2 12.7 1.2 36.9 38.2 37.8 37.6 36.3 76.1 73.8 6.4 19.1 33.6 47.3 43.1 32.2 1.1 16.0 1.9																									

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.02 a. m., 3.02 p. m., and 11.02 p. m., local time. Correction for instrumental error of barometer: From 7.02 a. m., January 1, to 11.02 p. m., December 31, 1884, inclusive, +.003 inch.

The barometric observations have been reduced to sea-level by adding the following constants for the various months: January 0.88; February 0.88; March 0.87; April, 0.87; May, 0.86; June, 0.85; July, 0.85; August 0.85; September, 0.86; October, 0.86; November, 0.87; December 0.88.

REMARKS.—One was removed from Giant Block to room No. 33 on third floor of custom-house on April 11, 1884, at which time changes in the elevation of the instruments occurred as follows: Barometer, 30.500 feet higher in new than in old office. Thermometers: exposed, 39.483 feet higher from ground in new office; rain-gauge, 20.680 feet higher from ground in new office; minimum, 39.789 feet higher from ground in new office.

JULIUS G. LINSLEY  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

PALESTINE, TEX.

Location of office on December 31, 1884, third floor I. and G. N. general office.

(Latitude, 31° 49' N.; longitude, 98° 40' W. Elevation of barometer above sea-level, 533 feet. Elevation of exposed thermometer above ground, 88 feet. Elevation of rain-gauge above ground, 2 feet.)

Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.			Wind.				
Month.	Washington time.			Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Mean maximum.	Mean minimum.	Total amount.	Any 8 consecutive hourly measurements.	Maximum hourly velocity during month.		Prevailing direction.	Total movement.	
	7 P. M.	3 P. M.	11 P. M.						Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.					Direction from—	Miles.			
1884.	In.	In.	In.	In.	In.	In.	In.	In.	7 a. m.	3 p. m.	11 p. m.	°	°	°	°	°	°	°	°	°	°	°	°
Jan.....	29.724	29.675	29.711	29.703	30.107	29.264	10	.843	34.9	44.9	40.8	°	°	°	°	°	°	°	°	°	°	°	°
Feb.....	29.524	29.518	29.534	29.524	29.906	29.137	18	.769	48.2	58.3	52.7	°	°	°	°	°	°	°	°	°	°	°	°
Mar.....	29.471	29.433	29.454	29.453	29.861	29.135	23	.726	53.1	64.5	60.1	°	°	°	°	°	°	°	°	°	°	°	°
Apr.....	29.429	29.406	29.469	29.415	29.701	29.032	14	.669	55.6	68.0	62.6	°	°	°	°	°	°	°	°	°	°	°	°
May.....	29.443	29.423	29.435	29.434	29.649	29.265	21	.384	63.7	76.5	68.3	°	°	°	°	°	°	°	°	°	°	°	°
June.....	29.459	29.430	29.430	29.440	29.607	29.286	24	.312	70.7	85.1	76.0	°	°	°	°	°	°	°	°	°	°	°	°
July.....	29.455	29.430	29.416	29.434	29.583	29.317	16	.266	76.1	91.6	82.4	°	°	°	°	°	°	°	°	°	°	°	°
Aug.....	29.515	29.480	29.453	29.433	29.654	29.323	29	.231	71.7	89.2	80.9	°	°	°	°	°	°	°	°	°	°	°	°
Sept.....	29.480	29.438	29.462	29.460	29.688	29.213	23	.475	72.2	88.5	78.1	°	°	°	°	°	°	°	°	°	°	°	°
Oct.....	29.562	29.553	29.534	29.576	29.827	29.213	26	.438	60.2	74.9	65.2	°	°	°	°	°	°	°	°	°	°	°	°
Nov.....	29.626	29.580	29.616	29.607	30.004	29.122	22	.882	47.4	62.7	53.4	°	°	°	°	°	°	°	°	°	°	°	°
Dec.....	29.519	29.485	29.525	29.510	29.836	29.088	4	.848	40.0	50.0	45.3	°	°	°	°	°	°	°	°	°	°	°	°
Sum.....	354,237	353,846	354,059	354,049				6,943	682.8	888.2	772.6												
Means.....	29.520	29.487	29.505	29.504	30.107	29.032	14	.579	57.8	71.6	63.8												

\* January.

† April.

‡ July.



## PALESTINE, TEX.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.	Relative humidity (per cent.).	Cloudiness (in tenths).					Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.			Washington time.					Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
											7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.										3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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*Meteorological summary for the year ending December 31, 1884—Continued.*

PENSACOLA, FLA.

Location of office on December 31, 1884, southwest corner Palafox and Saragosa streets.

[Latitude, 30° 20' N.; longitude, 87° 13' W. Elevation of barometer above sea-level, 30 feet. Elevation of exposed thermometer above ground, 20 feet. Elevation of rain-gauge above ground, 35 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).						Temperature.						Precipitation.		Wind.		Total movement.									
	Washington time.			Monthly mean.			Washington time			Self-registering thermometer.			Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.								
	7 p. m.	3 p. m.	11 p. m.	In.	Lowest.	Highest.	Date.	Range.	In.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Absolute range.			Mean maximum.	Mean minimum.	Total amount.	Amount.	Date.	Miles.	Direction.	Date.
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	
Jan.	30.240	30.191	30.228	30.220	30.674	31.29	31.11	31.23	31.63	41.9	51.4	45.8	46.471.3	11.16.3	6	55.0	54.1	37.0	3.60	1.75	7.8	28	N.	N.	6	
Feb.	30.109	30.070	30.091	30.080	30.345	31.29	31.10	31.27	31.63	54.0	64.3	58.6	63.974.3	9.29.0	29	43.3	67.6	51.9	3.43	1.33	17.30	31	S.	SE.	19	
Mar.	30.018	30.018	30.043	30.036	30.340	31.29	31.65	31.575	38.7	68.2	62.5	63.182.7	29.37.5	1	45.2	70.2	56.4	3.75	0.88	12.13	31	NE.	SE.	1		
Apr.	29.971	29.937	29.956	29.935	30.181	30.29	30.67	5	53.4	61.6	72.0	66.2	60.383.0	3.44.7	24	38.3	74.2	59.6	3.67	2.10	20.21	24	NE.	SE.	15	
May.	29.987	29.962	29.975	29.970	30.167	30.29	30.778	27	38.9	70.6	70.4	72.6	74.186.9	24.00.3	9	26.6	81.9	68.1	6.64	8.97	5	22	SW.	SW.	6-15	
June.	29.971	29.938	29.962	29.957	30.147	30.29	30.720	10	42.7	73.6	81.2	75.0	76.991.6	22.00.1	12	27.5	83.8	70.7	7.84	1.41	14.16	23	NW.	SW.	11-30	
July.	29.975	29.958	29.966	29.960	30.114	30.29	30.764	10	35.0	78.1	84.0	79.4	80.997.2	20.00.1	8	28.1	87.9	75.2	8.79	2.50	15.16	24	NW.	SW.	16-23	
Aug.	30.015	29.982	30.012	30.003	30.162	30.29	30.806	31	35.6	73.3	86.6	78.7	80.994.0	20.00.1	7	37.6	88.6	73.6	2.07	1.20	3.4	24	NW.	SW.	3	
Sept.	30.034	30.048	30.062	30.075	30.334	30.29	30.893	8	45.1	68.5	80.4	72.5	73.593.2	11.63.0	17	28.5	86.7	73.7	4.83	2.25	5.6	21	NE.	SE.	6	
Oct.	30.094	30.048	30.062	30.075	30.334	30.29	30.893	8	45.1	68.5	80.4	72.5	73.593.2	8.46.3	24	42.0	82.1	67.4	2.43	1.62	20.27	24	SE.	SE.	26-27	
Nov.	30.120	30.073	30.118	30.102	30.354	30.29	30.641	28	71.3	50.9	66.0	55.9	57.675.7	4.39.7	24	38.0	67.8	48.6	5.16	3.21	22.23	24	SE.	N.	23	
Dec.	30.109	30.064	30.106	30.093	30.384	30.29	30.686	5	69.6	52.2	60.4	55.4	56.073.6	11.23.0	19	50.6	63.7	48.6	5.00	1.31	13	24	SE.	N.	6-18	
Sums	300.673	300.246	300.564	300.495	300.674	300.674	300.674	300.674	300.674	300.674	300.674	300.674	300.674	300.674	300.674	300.674	300.674	300.674	300.674	300.674	300.674	300.674	300.674	300.674	300.674	300.674
Means.	30.056	30.029	30.047	30.041	30.071	30.071	30.071	30.071	30.071	30.071	30.071	30.071	30.071	30.071	30.071	30.071	30.071	30.071	30.071	30.071	30.071	30.071	30.071	30.071	30.071	30.071

\* January.

† November.

‡ July.

## 417

10048 SIG—27

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.19 a. m., 2.19 p. m., and 10.19 p. m., local time.

**0.030.** The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.030; February, 0.030; March, 0.030; April, 0.030; May, 0.030; June, 0.030; July, 0.030; August, 0.030; September, 0.030; October, 0.030; November, 0.030; December, 0.030.

**REMARKS.**—Last frost of spring, March 1; first frost of autumn, November 21.

**M. MCGAURAN,**  
*Sergeant, Signal Corps, U. S. A.*



PHILADELPHIA, PA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—								Dew-point.	Relative humidity (per- cent.).	Cloudiness (in tenths).			Number of days—											
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.			Washington time.			Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.	Thunder-storms.	Aurora.			
											7 a. m.	3 p. m.	11 p. m.										Mean.	7 a. m.	3 p. m.
1884.																									
Jan.....	6	20	4	1	6	24	9	20	3	19.6	23.7	22.4	21.9	75.5	71.4	73.4	73.3	78.4	4.9	7.2	15	11	26	0	0
Feb.....	7	26	5	5	6	14	6	17	1	35.1	34.5	33.0	34.2	87.5	73.4	78.4	78.3	78.8	5.8	6.7	16	12	0	0	0
Mar.....	5	23	3	3	4	18	10	29	5	32.4	37.5	34.7	34.9	83.2	73.8	78.4	78.3	78.4	7.2	10	16	3	0	0	
Apr.....	8	18	4	6	1	12	4	4	1	39.6	46.3	42.7	42.8	83.1	74.3	87.0	87.0	81.5	4.7	5.4	16	9	0	0	0
May.....	2	17	1	1	6	30	9	22	2	53.9	61.9	55.8	57.2	89.2	80.7	91.5	91.5	87.1	4.5	4.8	10	0	0	0	0
June.....	7	29	3	5	13	22	3	6	2	60.6	67.7	62.2	63.5	84.9	70.0	85.2	85.2	80.0	4.1	4.6	12	0	0	0	0
July.....	10	11	2	4	7	19	5	39	5	62.3	66.6	63.7	64.2	87.1	68.0	83.7	83.7	78.3	5.5	5.5	8	0	0	0	0
Aug.....	14	17	2	11	19	12	4	8	6	72.8	63.8	64.7	63.8	82.9	61.8	83.5	83.5	76.1	5.5	6.0	12	0	0	0	0
Sept.....	14	4	2	6	43	7	5	6	3	58.4	57.0	59.4	58.3	80.9	48.0	74.7	72.2	67.9	3.0	3.8	11	0	0	0	0
Oct.....	32	8	3	2	28	3	3	12	2	45.4	45.6	45.8	45.6	78.1	53.2	72.2	67.8	4.1	5.2	13	0	0	0	0	
Nov.....	25	7	3	2	18	6	6	9	5	31.6	33.0	34.2	32.9	73.5	55.4	74.2	67.7	4.8	5.2	9	6	0	0	0	
Dec.....	14	15	3	2	6	15	15	19	4	25.3	28.0	27.1	26.8	79.3	68.9	75.9	74.7	5.6	6.6	13	11	16	0	0	
Sums..	144	190	35	54	157	172	82	225	39	527.0	565.6	545.6	546.1	981.2	798.9	957.9	912.7	80.0	72.8	133	21	70	12	23	0
Means.	Percentages.																								
	12.1	17.8	3.2	4.9	14.8	15.7	7.5	20.5	3.6	43.9	47.1	45.5	45.5	81.8	66.6	79.8	76.1	5.0	6.1	20.3	43.4	24.8	3.3	6.3	0

NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond to 7.08 a. m., 3.08 p. m., and 11.08 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, + .008 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.130; February, 0.130; March, 0.130; April, 0.130; May, 0.120; June, 0.120; July, 0.120; August, 0.120; September, 0.120; October, 0.130; November, 0.130; December, 0.130.

REMARKS.—January, frosts, 14th, 21st, and 30th; February, frosts, 3d; lunar halo 3d; March, lunar halo 6th; April, office moved on the 1st; elevation of barometer changed from 92.119 feet to 117 feet; thermometer from 55 feet to 174 feet; rain-gauge, 106 feet to 166.5 feet; anemometer, 110 feet to 175 feet; August, lunar halo, 1st and 12th; frost, 21st and 22d; first snow of the season, 18th November; lunar halo 23d; frost, 24th, 4th and 6th.

CHAS. N. KITCHEN,  
Sergeant, Signal Corps, U. S. A.



**PTON'S PEAK, COLO.—Continued.**

[illegible]

NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond to 5.08 a. m., 1.08 p. m., and 9.08 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.043 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 12.70; February, 12.77; March, 12.59; April, 12.28; May, 12.09; June, 11.78; July, 11.79; September, 11.98; October, 12.28; November, 12.66; December, 12.64.

REMARKS.—Unusually bright coronæ, with a lunar halo on the 29th of December.

REMARKS.—Unusually bright coronæ, with a lunar halo on the 29th of December.

**H. HALL,**  
*Sergeant, Signal Corps, U. S. A.*

*Meteorological summary for the year ending December 31, 1884—Continued.*

PITTSBURG, PA.

Location of office on December 31, 1884, corner Fifth avenue and Wood street.

[Latitude, 40° 22' N.; longitude, 80° 2' W. Elevation of barometer above sea-level, 706 feet. Elevation of exposed thermometer above ground, 88 feet. Elevation of rain-gauge above ground, 86 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.			Total movement.									
Washington time.				Monthly mean.		Highest.		Lowest.		Range.		Washington time.				Self-registering thermometers.				Mean maximum.		Mean minimum.		Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.		
7 P. M.		9 P. M.		11 P. M.		In.	Feet.	Date.	Range.	7 A. M.	9 P. M.	11 P. M.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.		Total amount.	Largest amount.	Date.	Miles.	Direction.	Date.			
In.	Feet.	In.	Feet.	In.	Feet.																								In.	Feet.
1884.																														
Jan.....	28.231	28.268	28.264	28.261	28.267	28.261	28.267	28.261	28.267	28.261	28.267	28.261	28.267	28.261	28.267	28.261	28.267	28.261	28.267	28.261	28.267	28.261	28.267	28.261	28.267	28.261	28.267	28.261	28.267	
Feb.....	28.211	28.164	28.165	28.163	28.167	28.165	28.167	28.165	28.167	28.165	28.167	28.165	28.167	28.165	28.167	28.165	28.167	28.165	28.167	28.165	28.167	28.165	28.167	28.165	28.167	28.165	28.167	28.165	28.167	
Mar.....	28.204	28.178	28.185	28.187	28.185	28.187	28.185	28.187	28.185	28.187	28.185	28.187	28.185	28.187	28.185	28.187	28.185	28.187	28.185	28.187	28.185	28.187	28.185	28.187	28.185	28.187	28.185	28.187	28.185	28.187
Apr.....	28.107	28.058	28.068	28.065	28.069	28.068	28.069	28.068	28.069	28.068	28.069	28.068	28.069	28.068	28.069	28.068	28.069	28.068	28.069	28.068	28.069	28.068	28.069	28.068	28.069	28.068	28.069	28.068	28.069	
May.....	28.162	28.107	28.127	28.122	28.122	28.122	28.122	28.122	28.122	28.122	28.122	28.122	28.122	28.122	28.122	28.122	28.122	28.122	28.122	28.122	28.122	28.122	28.122	28.122	28.122	28.122	28.122	28.122	28.122	
June.....	28.277	28.215	28.230	28.241	28.238	28.238	28.238	28.238	28.238	28.238	28.238	28.238	28.238	28.238	28.238	28.238	28.238	28.238	28.238	28.238	28.238	28.238	28.238	28.238	28.238	28.238	28.238	28.238	28.238	
July.....	28.114	28.087	28.093	28.091	28.093	28.091	28.093	28.091	28.093	28.091	28.093	28.091	28.093	28.091	28.093	28.091	28.093	28.091	28.093	28.091	28.093	28.091	28.093	28.091	28.093	28.091	28.093	28.091	28.093	
Aug.....	28.258	28.213	28.229	28.227	28.227	28.227	28.227	28.227	28.227	28.227	28.227	28.227	28.227	28.227	28.227	28.227	28.227	28.227	28.227	28.227	28.227	28.227	28.227	28.227	28.227	28.227	28.227	28.227	28.227	
Sept.....	28.213	28.243	28.277	28.277	28.277	28.277	28.277	28.277	28.277	28.277	28.277	28.277	28.277	28.277	28.277	28.277	28.277	28.277	28.277	28.277	28.277	28.277	28.277	28.277	28.277	28.277	28.277	28.277	28.277	
Oct.....	28.254	28.203	28.218	28.225	28.225	28.225	28.225	28.225	28.225	28.225	28.225	28.225	28.225	28.225	28.225	28.225	28.225	28.225	28.225	28.225	28.225	28.225	28.225	28.225	28.225	28.225	28.225	28.225	28.225	
Nov.....	28.268	28.221	28.228	28.249	28.251	28.251	28.251	28.251	28.251	28.251	28.251	28.251	28.251	28.251	28.251	28.251	28.251	28.251	28.251	28.251	28.251	28.251	28.251	28.251	28.251	28.251	28.251	28.251	28.251	
Dec.....	28.202	28.267	28.266	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	
Sum.....	28.202	28.267	28.266	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	28.268	
Means.....	28.211	28.198	28.210	28.216	28.216	28.216	28.216	28.216	28.216	28.216	28.216	28.216	28.216	28.216	28.216	28.216	28.216	28.216	28.216	28.216	28.216	28.216	28.216	28.216	28.216	28.216	28.216	28.216	28.216	

• January.

† April.

‡ September.



## PITTSBURG, PA.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.			Relative humidity (per cent.).			Cloudiness (in tenths).			Number of days—						River.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.			Washington time.			Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 35°.	Minimum below 35°.	Maximum above 30°.	Thunder-storms.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
									7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.									11 p. m.			Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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\* February.

† October.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.48 a. m., 2.48 p. m., and 10.48 p. m., local time. Corrections for instrumental error of barometer used: From 6.48 a. m., January 1, to 2.48 p. m., April 13, inclusive, +.006 inch; from 2.48 p. m., April 13, inclusive, +.006 inch; from 2.48 a. m., May 1, to 10.48 p. m., December 31, 1884, inclusive, +.006 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.850; February, 0.860; March, 0.850; April, 0.830; May, 0.800; June, 0.790; July, 0.790; August, 0.790; September, 0.790; October, 0.820; November, 0.850; December, 0.860.

REMARKS.—High water, February 1; flood, February 5 to 6, inclusive, highest water since 1832, 33 feet 4 inches; last snowfall of season, April 9; last heavy frost, April 12; last frost of season, May 30; first frost of season, October 10; first killing frost and ice, October 24; heaviest snowfall of season, 18 inches, January 8; first snowfall of season, October 23; partial July 29; polar bands, June 26; shooting stars and meteors, April 7, July 20, August 10, 15, 17, September 11, 14, and October 3; solar halo, May 8, June 30, July 26, and October 17; lunar halo, January 7, 13, March 13, May 11, June 5, July 3, 12, August 4, 30, and December 28; lunar corona, March 10, 12, May 12, June 6, 9, July 5, 7, 30, August 1, 31, September 3, October 2, 28, and December 5, 27, 29, 30; heavy rains, February 5, 6, 19, 20, March 12, 19, 23, April 1, May 5, July 24, 28, 31, August 16, September 17, and December 15.

C. L. BOZZELL, Private, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

POPLAR RIVER, MONT.

Location of office on December 31, 1884, post quarters.

[Latitude, 48° 9' N.; longitude 109° 10' W. Elevation of barometer above sea-level, 2,080 (B) feet. Elevation of exposed thermometer above ground, 4 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer readings (corrected for temperature and instrumental error only).				Temperature.				Precipitation.		Wind.		
	Washington time.				Self-registering thermometers.				Total amount.	Any consecutive 8-hourly measurements.	Maximum hourly velocity during month.		
	7 p. m.	9 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.			Miles.	Direction from —	Prevailing direction.
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Jan. 1	27.777	27.813	27.835	27.808	28.317	22	27.427	18	20	29	Gale N.E.	11	W.
Feb.	27.777	27.813	27.835	27.808	28.317	22	27.427	18	20	29	Gale N.W.	12	W.
Mar.	27.777	27.813	27.835	27.808	28.317	22	27.427	18	20	29	Gale N.W.	12	W.
Apr.	27.777	27.813	27.835	27.808	28.317	22	27.427	18	20	29	Gale N.W.	12	W.
May	27.777	27.813	27.835	27.808	28.317	22	27.427	18	20	29	Gale N.W.	12	W.
June	27.777	27.813	27.835	27.808	28.317	22	27.427	18	20	29	Gale N.W.	12	W.
July	27.777	27.813	27.835	27.808	28.317	22	27.427	18	20	29	Gale N.W.	12	W.
Aug.	27.777	27.813	27.835	27.808	28.317	22	27.427	18	20	29	Gale N.W.	12	W.
Sept.	27.777	27.813	27.835	27.808	28.317	22	27.427	18	20	29	Gale N.W.	12	W.
Oct.	27.777	27.813	27.835	27.808	28.317	22	27.427	18	20	29	Gale N.W.	12	W.
Nov.	27.777	27.813	27.835	27.808	28.317	22	27.427	18	20	29	Gale N.W.	12	W.
Dec.	27.777	27.813	27.835	27.808	28.317	22	27.427	18	20	29	Gale N.W.	12	W.
Sum.	27.777	27.813	27.835	27.808	28.317	22	27.427	18	20	29	Gale N.W.	12	W.
Mean.	27.777	27.813	27.835	27.808	28.317	22	27.427	18	20	29	Gale N.W.	12	W.
Observations for 23 days.	27.777	27.813	27.835	27.808	28.317	22	27.427	18	20	29	Gale N.W.	12	W.
Observations for 19 days.	27.777	27.813	27.835	27.808	28.317	22	27.427	18	20	29	Gale N.W.	12	W.
Observations for 29 days.	27.777	27.813	27.835	27.808	28.317	22	27.427	18	20	29	Gale N.W.	12	W.
Observations for 35 days.	27.777	27.813	27.835	27.808	28.317	22	27.427	18	20	29	Gale N.W.	12	W.

## POPLAR RIVER, MONT.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.	Relative humidity (per cent.).	Cloudiness (in tenths).					Number of days—										
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.			Washington time.					Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.	Thunder-storms.	Aurora.		
											7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.								
1894.																										
Jan.....	3	8	7	28	0	3	35	9	4	8.0	7.4	0.6	0.4	89.0	91.1	87.2	88.1	5.4	6.8	4.2	18	23	0	1		
Feb.....	5	7			1	8	30	5	3	13.6	0.3	0.4	0.8	80.6	91.7	90.1	90.5	5.9	6.4	5.2	25	20	0	0		
Mar.....																										
Apr.....																										
May.....	8	24	13	5	19	2	30	2	6	37.7	45.8	42.9	42.1	85.7	79.5	87.1	84.1	4.0	4.1	4.3	6	19	0	0		
June.....	7	19	4	25	5	2	15	2	5	51.3	55.1	55.1	53.8	75.5	47.4	72.7	65.2	4.5	4.1	4.3	5	25	0	0		
July.....	10	9	23	9	5	3	22	6	2	49.3	57.9	56.9	54.7	81.0	53.9	63.7	74.2	4.7	4.9	4.7	0	19	0	0		
Aug.....	6	13	5	11	8	10	23	6	0	46.4	61.4	56.6	54.2	79.9	54.8	74.8	68.7	4.4	4.6	4.5	0	21	0	0		
Sept.....	15	6	4	13	1	1	37	6	0	37.5	51.1	45.3	44.6	87.6	67.1	84.7	78.8	4.7	4.7	4.3	0	0	0	0		
Oct.....	17	12	0	10	6	36	6	0	8	27.0	42.6	35.9	35.2	87.0	64.9	80.2	77.4	4.4	4.3	3.6	17	0	0	0		
Nov.....	17	12	0	10	6	36	6	0	8	14.7	32.8	25.0	24.2	83.6	85.8	95.3	91.6	4.6	4.6	3.2	24	0	0	0		
Dec.....	18	12	0	10	6	36	6	0	11	8.9	1.6	4.8	3.0	93.5	94.2	96.8	97.2	5.0	5.6	3.9	24	0	0	0		
Sum.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....		
Means.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....		
	Percentages.										60.5	61.8	43.2	54.9	138	189	81	71	77	175	16	2	6			
	Percentages.										4.6	37.3	33.3	23.9	30.9	22.7	51.6	4.7	0.9	1.8						

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.08 a. m., 1.08 p. m., and 9.08 p. m., local time.  
Correction for instrumental error of barometer used: From 7 a. m., October 1, to 11 p. m., December 31, 1884, inclusive, +.010 inch.  
The barometric observations may be reduced to sea-level by adding the following constants for the various months: October, .23; November, .29; December, .36.

GEO. A. GARDEN,  
Private, Signal Corps, U. S. A.



## PORT HURON, MICH.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of time observed blowing from—								Dew-point.	Relative humidity (per cent.).		Cloudiness (in tenths).					Number of days—													
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Number of calms.	Washington time.					Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 33°.	Minimum below 33°.	Maximum above 90°.	Thunder-storms.	Aurora.						
											7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.										8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.
1884.																														
Jan.....	9	0	0	4	16	17	15	16	16	1	8.6	12.4	10.4	10.5	83.6	74.9	81.0	79.8	7.0	7.0	7.7	7.2	3	12	16	24	30	0	0	0
Feb.....	18	0	0	5	16	17	16	19	18	1	17.5	24.9	23.6	18.9	80.4	77.2	84.8	82.5	8.4	8.1	6.4	7.6	3	17	21	14	28	0	0	0
Mar.....	17	23	6	8	15	10	7	10	12	1	31.2	31.5	31.1	31.3	83.2	64.9	78.7	75.3	5.0	5.0	4.4	5.2	10	13	8	11	0	0	0	
Apr.....	7	28	1	9	13	8	1	8	11	1	44.4	43.0	43.4	42.6	82.9	58.9	77.3	72.0	5.7	5.7	4.4	5.2	13	10	9	10	0	0	0	
May.....	12	24	2	9	14	10	8	11	11	1	55.0	55.3	54.8	55.5	80.2	60.2	79.4	72.4	4.8	4.8	2.8	3.4	13	15	2	7	0	0	0	
June.....	6	21	4	10	18	12	9	8	7	0	55.6	55.3	55.4	55.7	84.6	59.6	80.7	75.0	3.9	4.0	2.8	3.6	17	11	3	10	0	0	0	
July.....	2	13	7	9	25	17	10	8	5	0	43.4	43.9	43.8	43.4	87.0	59.8	77.9	72.2	3.7	4.1	2.7	3.6	13	15	4	9	0	0	0	
Aug.....	6	11	4	0	20	18	16	18	9	0	28.0	31.1	29.5	29.7	88.3	75.9	83.0	83.2	6.3	7.4	4.4	5.4	4	13	10	8	18	0	0	0
Sept.....	1	6	4	0	20	19	18	18	8	1	19.4	35.0	23.9	22.4	87.8	88.3	89.4	87.0	6.5	7.6	7.1	7.1	4	12	15	19	11	25	0	0
Oct.....	1	6	4	0	20	19	18	18	8	1	19.4	35.0	23.9	22.4	87.8	88.3	89.4	87.0	6.5	7.6	7.1	7.1	4	12	15	19	11	25	0	0
Nov.....	1	6	4	0	20	19	18	18	8	1	19.4	35.0	23.9	22.4	87.8	88.3	89.4	87.0	6.5	7.6	7.1	7.1	4	12	15	19	11	25	0	0
Dec.....	1	6	4	0	20	19	18	18	8	1	19.4	35.0	23.9	22.4	87.8	88.3	89.4	87.0	6.5	7.6	7.1	7.1	4	12	15	19	11	25	0	0
Sum.....	111	207	44	64	227	163	121	101	90	437.4	452.0	448.1	445.9	1,014.5	813.6	974.7	934.2	65.0	73.5	53.2	63.7	113	163	102	148	67	139	4	18	1
Means..	Percentages.										Percentages.											Percentages.								
	10.1	18.9	4.0	5.9	20.7	14.6	11.0	9.2	5.5	86.4	87.7	87.3	87.1	84.5	67.8	81.2	77.8	5.4	6.1	4.4	5.3	30.6	41.5	27.9	40.4	18.8	38.0	1.1	4.9	0.5

NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond to 6.38 a. m., 2.38 p. m., and 10.38 p. m., local time.

Correction for instrumental error of barometer used: From 6.38 a. m., January 1, to 10.38 p. m., December 31, 1884, inclusive, —.001 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.730; February, 0.730; March, 0.730; April, 0.700; May, 0.680; June, 0.670; July, 0.660; August, 0.660; September, 0.670; October, 0.690; November, 0.720; December, 0.730.

Remarks.—Aurora April 24 from 10.50 p. m. to 11.45 p. m.; hail-storm April 27; during August and September very dry; destructive forest fires September 15, 16, and 17; first frost August 24; last frost May 2.

M. H. PERRY,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

PORTLAND, ME.

Location of office on December 31, 1884, United States custom-house, corner Fore and Pearl streets.

[Latitude, 43° 39' N.; longitude, 70° 18' W. Elevation of barometer above sea-level, 45 feet. Elevation of exposed thermometer above ground, 28 feet. Elevation of rain-gauge above ground, 77 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	Washington time.					Monthly mean.					Washington time.					Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any & consecutive 8-hourly measurements.	Maximum hourly velocity during month.			Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	11 p. m.	9 p. m.	7 a. m.	Date.	Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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\* December.

† February.

‡ June.

## PORTLAND, ME.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calm.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—					
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Washington time.				Mean.				Clear.	Fair.	Cloudy.	On which 0.1 inch or more precipitation fell.	Maximum below 33°.	Minimum below 33°.	Maximum above 30°.	Thunder-storms.	Aurora.	
										7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.										7 a. m.
1884.																											
Jan.....	20	13	12	0	5	31	8	12	1	12.5	18.0	15.4	15.2	77.9	70.2	74.8	74.8	74.8	17	30	0	0	0	0			
Feb.....	19	20	11	5	3	13	2	15	1	21.6	25.1	22.1	23.6	73.7	72.6	75.9	75.7	20	6	28	0	0	0				
Mar.....	20	13	9	5	3	15	4	19	0	21.4	25.8	22.1	23.6	71.9	69.0	70.0	67.4	7	7	13	0	0	0				
Apr.....	10	22	14	8	5	12	6	18	0	34.9	30.7	35.2	35.6	75.6	69.0	73.0	69.7	14	4	0	0	0	0				
May.....	0	10	11	10	13	10	20	7	1	40.4	42.0	41.3	41.4	70.4	58.3	63.8	65.1	16	0	0	0	0	0				
June.....	10	9	6	4	18	17	12	10	2	53.0	55.0	54.3	54.1	77.7	60.0	77.3	68.0	12	0	0	0	0	0				
July.....	9	6	6	7	23	16	19	7	0	57.4	58.5	56.7	57.6	83.6	68.0	77.3	71.8	19	0	0	0	0	0				
Aug.....	9	3	2	6	26	19	17	13	0	50.3	54.2	50.7	50.1	78.8	63.7	82.4	73.5	4	0	0	0	0	0				
Sept.....	9	3	2	6	26	19	17	13	0	53.0	54.2	50.7	50.1	78.8	63.7	82.4	73.5	11	0	0	0	0	0				
Oct.....	15	6	3	2	10	19	11	22	1	39.6	41.2	30.7	30.2	73.5	60.5	72.6	64.5	13	1	0	0	0	0				
Nov.....	13	6	3	2	7	22	23	10	8	23.2	30.7	30.8	30.2	77.8	67.4	74.8	71.7	11	1	0	0	0	0				
Dec.....	24	6	7	2	5	22	16	11	0	22.4	35.4	24.8	24.2	78.1	72.8	80.8	77.2	13	7	20	0	0	0				
Sums ..	176	121	56	60	161	190	151	155	28	444.9	476.3	453.8	460.0	914.5	763.8	900.2	860.1	88	171	107	162	38	110	0	13	13	
Means ..	Percentages.																										
	16.0	11.0	5.1	5.5	14.7	17.3	13.8	14.1	2.5	37.1	33.7	33.2	33.8	76.2	63.8	75.0	71.7	5.4	24.0	45.7	23.2	44.3	10.4	30.1	0.3	0.3	0.3

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.27 a. m., 3.27 p. m., and 11.27 p. m., local time. Correction for instrumental error of barometer used: From 7.27 a. m., January 1, to 11.27 p. m., December 31, 1884, inclusive, +.001 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.050; February, 0.050; March, 0.050; April, 0.050; May, 0.050; June, 0.050; July, 0.050; August, 0.050; September, 0.050; October, 0.050; November, 0.050; December, 0.050.

G. LIEBMAN,  
Sergeant, Signal Corps, U. S. A.







*Meteorological summary for the year ending December 31, 1884—Continued.*

PRESCOTT, ARIZ.

Location of office on December 31, 1884, post quarters.

[Latitude, 34° 39' N.; longitude, 112° 28' W. Elevation of barometer above sea-level, 5,359 feet. Elevation of exposed thermometer above ground, 7 feet. Elevation of rain-gauge above ground, 3 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).							Temperature.							Precipitation.		Wind.			Total movement.			
	Washington time.			Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometer.	Total amount.	Any 2 consecutive 2-hourly measurements.	Date.	Miles.	Direction from—	Maximum hourly velocity during month.	Prevailing direction.				
	7 a. m.	3 p. m.	11 p. m.																				
1884.																							
Jan.	24.733	24.777	24.792	24.794	24.967	24.513	25	5.54	23.6	46.8	35.6	37.0	62.0	12	13.0	2	48.0	50.5	25.8	10	SW.	40	NE
Feb.	24.671	24.678	24.689	24.690	24.866	24.496	6	4.00	31.5	46.1	33.0	38.5	67.2	25	10.0	13	57.2	33.8	25.8	10	SW.	40	SW.
Mar.	24.613	24.611	24.639	24.631	24.800	24.320	23	5.60	33.6	43.0	40.0	40.8	63.0	14	20.0	13	43.0	32.1	31.8	10	SW.	40	SW.
Apr.	24.634	24.639	24.647	24.647	24.815	24.453	23	5.34	35.7	54.9	43.4	45.4	71.2	19	18.3	1	52.0	58.4	24.4	1	SW.	40	SW.
May.	24.703	24.715	24.712	24.711	24.893	24.511	20	5.33	43.0	60.3	54.9	54.7	92.5	30	18.3	2	52.0	68.9	19.1	1	SW.	40	SW.
June.	24.728	24.746	24.733	24.735	24.894	24.496	5	3.01	45.2	77.3	62.9	62.8	92.5	30	37.0	4	55.5	80.2	47.6	1	SW.	40	SW.
July.	24.789	24.815	24.794	24.803	24.899	24.700	8	1.80	57.8	85.7	72.2	71.9	96.0	5	40.8	17	49.2	83.5	57.4	1	SW.	40	SW.
Aug.	24.798	24.807	24.798	24.801	24.916	24.538	18	4.08	66.8	79.7	67.7	68.1	91.5	1	41.2	19	50.3	83.5	55.8	1	SW.	40	SW.
Sept.	24.768	24.750	24.739	24.742	24.906	24.463	30	4.43	43.6	72.3	59.2	60.5	87.0	20	32.6	28	54.7	70.3	44.9	1	SW.	40	SW.
Oct.	24.745	24.748	24.760	24.751	25.011	24.320	11	6.91	43.5	63.8	51.2	53.5	79.0	8	23.6	28	49.4	63.7	41.5	1	SW.	40	SW.
Nov.	24.792	24.785	24.805	24.794	24.904	24.438	21	5.28	31.1	66.1	40.1	43.4	69.0	1	4.5	15.0	53.4	62.0	23.7	1	SW.	40	SW.
Dec.	24.614	24.615	24.634	24.621	24.975	24.259	27	7.16	26.8	42.9	31.0	33.6	64.0	2	3	81	68.5	45.0	58.9	1	SW.	40	SW.
Sums.	234.622	234.736	234.742	234.701	235.067	234.006	16	6.175	485.2	745.9	592.8	610.2	96.0	15	4	531	635.4	478.4	228.76	1	SW.	40	SW.
Means.	24.718	24.728	24.728	24.726	24.726	24.506	16	6.15	40.4	62.2	50.0	50.9	96.0	15	4	531	635.4	478.4	228.76	1	SW.	40	SW.

January.

February.

July.

December.

**PRESCOTT, ARIZ.—Continued.**

[illegible]

NOTE.—7 a. m., and 11 p. m., Washington time, correspond to 4.38 a. m., 12.38 p. m., and 8.38 p. m., local time.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.38 a. m., 12.38 p. m., and 8.38 p. m., local time. Correction for instrumental error of barometer used: From 4.38 a. m., January 1, to 8.38 p. m., December 31, 1884 inclusive, —.510 inch.

The barometric observations may be reduced to sea-level by adding the following constants: January, 5.43; February, 5.41; March, 5.39; April,

**5.27;** May, 5.14; June 5.06; July, 5.03; September, 5.02; October, 5.20; November, 5.39; December, 5.42.  
REMARKS—Office moved March 18 1884 and elevation of barometer cistern increased 49 feet. Thermometers changed March 18 from an elevation of 10 feet to 6.8 feet.

REMARKS.—Office moved March 18, 1884, and elevation of barometer western increased 40 feet. Thermometers changed March 18 from an elevation of 10 feet to 6.8 feet; rain-gauge from 3 feet to 3.2 feet.

**JNO. GROVER**

*Meteorological summary for the year ending December 31, 1884—Continued.*

PROVINCETOWN, MASS.

Location of office on March 31, 1884, Center street, between Commercial and Bradford streets.

[Latitude, 43° 9' N.; longitude, 70° 11' W. Elevation of barometer above sea-level, 28 feet. Elevation of exposed thermometer above ground, 23 feet. Elevation of rain-gauge above ground, 35 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.								Precipitation.			Wind.			Total movement					
	Washington time.			Monthly mean.	Highest.	Lowest.	Date.	Range.	Self-registering thermometer.				Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.										
	7 p. m.	8 p. m.	11 p. m.							Maximum.	Date.	Minimum.	Date.	Absolute range.	7 a. m.	8 p. m.	11 p. m.	Monthly mean.												
1884.																														
Jan.....	30.079	30.085	30.083	30.049	30.765	29.123	2	1.642	28.7	30.4	28.5	28.5	48.4	9	8.4	6	39.0	34.8	22.7	6.58	2.77	6	53	SE	9	SW., } W., } NW. }	8,919			
Feb. "	30.040	30.975	30.047	30.074	30.759	28.739	28	2.020	32.2	34.3	32.7	34.1	43.8	14	0.3	29	43.5	40.3	27.5	7.34	1.73	23	49	SE	20	NW.	7,749			
Mar.....	30.961	30.927	30.943	30.943	30.400	29.379	29	1.021	32.2	37.5	34.0	34.6	57.0	24	6.4	1	50.6	41.1	28.7	6.77	2.18	27	43	SE.	26	NW.	8,448			
Apr.....																														
May.....																														
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Oct.....																														
Nov.....																														
Dec.....																														
Sums																														
Means																														

\* One 11 p. m. observation missed.

## PROVINCETOWN, MASS.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.	Relative humidity (per cent.).	Cloudiness (in tenths).	Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.				Number of calms.	Washington time.								Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 33°.	Minimum below 33°.	Maximum above 30°.	Thunder-storms.	Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
													7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.										7 a. m.	3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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NOTE.—7 p. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.37 a. m., 3.27 p. m., and 11.27 p. m., local time.  
 Correction for instrumental error of barometer used: From 7.27 a. m., January 1, to 11.27 p. m., March 31, 1884, inclusive, — .001 inch.  
 The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.080; February, 0.080; March, 0.080.  
 Station closed April 1.

O. N. KITCHEN,  
*Argonaut, Signal Corps, U. S. A.*

*Meteorological summary for the year ending December 31, 1884—Continued.*

RED BLUFF, OAL.

Location of office on December 31, 1884, corner Main and Pine streets.

[Latitude, 40° 10' N.; longitude, 122° 15' W. Elevation of barometer above sea-level, 833 feet. Elevation of exposed thermometer above ground, 28 feet. Elevation of rain-gauge above ground, 30 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.			Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	Washington time.			Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.				Total amount.	Any 2 consecutive 8-hourly measurements.	Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	7 p. m.	3 p. m.	11 p. m.						7 p. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.			Absolute range.	Mean maximum.		Mean minimum.		Largest amount.	Date.	Miles.	Direction from—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.

Y Imperceptible.

Y February.

Y August.

Y March.

Y January.

\* Night observations missed.

## RED BLUFF, CAL.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m. Washington time: Number of times observed blowing from—										Dew-point.				Relative humidity (per cent.).		Clearness (in tenths).		Number of days—							River.													
	Number of calms.										7 a. m.		8 p. m.		11 p. m.		Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Minimum below 32°.	Maximum above 32°.	Thunder-storms.	Highest.		Date.	Lowest.	Date.	Range.	Mean.								
1884.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.			7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Minimum below 32°.	Maximum above 32°.	Thunder-storms.	Highest.	Date.	Lowest.	Date.	Range.	Mean.								
Jan	66	0	0	0	14	0	1	8	4	33.2	36.5	37.9	36.5	82.3	82.9	74.8	73.3	3.7	4.7	4.0	4.1	15	0	0	0	0	10	6	0	10	10								
Feb	50	0	1	1	22	0	1	17	0	40.9	34.4	36.7	38.4	84.3	84.3	69.9	73.8	3.2	4.7	3.8	4.1	15	0	0	0	0	10	16	5	10									
Mar	39	0	1	1	36	0	0	13	0	43.0	41.6	41.6	43.0	85.4	85.4	72.9	73.8	4.0	5.4	4.2	4.8	13	0	0	0	0	10	10	5	10									
Apr	29	1	2	2	41	4	3	11	5	45.9	44.7	49.2	46.6	88.8	84.7	74.5	73.8	4.0	5.1	4.3	4.8	11	0	0	0	0	10	15	6	10									
May	22	1	3	4	23	2	2	11	5	50.0	49.1	52.1	50.5	76.4	76.4	57.0	59.2	3.9	5.7	4.9	5.3	13	0	0	0	0	10	15	7	10									
June	13	1	3	7	40	4	0	20	8	53.5	51.1	52.1	52.2	81.6	82.6	64.6	69.3	3.6	5.6	4.3	5.2	14	0	0	0	0	10	15	8	10									
July	19	2	4	9	34	1	0	20	4	49.7	47.2	47.2	48.0	80.5	80.5	60.2	68.3	3.6	5.6	4.3	5.2	20	1	0	0	0	10	15	10	10									
Aug	14	0	13	5	39	0	0	16	6	53.3	49.6	50.6	50.8	86.5	85.5	61.0	68.2	3.4	5.7	4.1	5.7	20	1	0	0	0	10	15	10	10									
Sept	38	1	8	1	20	0	0	13	6	43.8	43.0	43.1	43.0	63.7	63.7	44.0	46.4	7	3.8	1.9	1.3	24	0	0	0	0	10	15	10	10									
Oct	48	2	8	0	12	0	0	14	9	41.5	41.2	44.3	42.3	67.4	67.8	53.1	52.8	2	2.0	1.3	1.3	22	0	0	0	0	10	15	8	10									
Nov	44	0	6	1	10	2	0	17	7	40.0	40.3	41.4	40.6	77.5	75.4	63.9	62.3	1.9	2.3	1.4	2.4	23	0	0	0	0	10	15	0	11									
Dec	34	0	5	1	26	2	1	21	3	33.5	34.2	34.3	34.0	72.7	68.6	63.5	63.6	4.5	5.1	3.5	4.5	14	0	0	0	0	10	15	5	4									
Sums	400	8	67	30	335	11	10	167	62	321.3	351.1	352.8	352.1	688.6	688.6	544.0	544.0	40.8	40.8	33.4	33.4	235	84	59	71	0	15	63	4	36									
Percentages.																																							
Means.	36.7	7.6	2.2	8.6	7.1	0.0	0.1	3.5	7	42.4	42.7	44.4	43.5	74.9	74.9	65.4	65.4	2.7	3.4	2.8	3.0	23.2	21.4	6.0	6.1	0	15	5	3	11.7									

For 23 days. 1 Percentage for 360 days.

April. 5 January 2, 4, 5; August, 30, 31; September 1-3, 11-13, 25-30; October 1-13; December 8-17.

Note.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond to 3.59 a. m., 11.59 a. m., and 7.59 p. m. local time.

Correction for instrumental error of barometer used: From 7 a. m. January 1, to 11 p. m. December 31, 1884, inclusive, +.010 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.370; February, 0.370; March, 0.370; April, 0.360; May, 0.350; June, 0.350; July, 0.340; August, 0.350; September, 0.350; October, 0.360; November, 0.370; December, 0.370.

REMARKS.—River-gauge carried away by high water, March 9; earthquake, 1 a. m. June 6; brilliant red sunsets, October 17-22, inclusive; cyclone, December 2.

J. E. WILLIAMS,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

RIO GRANDE CITY, TEX.

Location of office on December 31, 1884, Clay street, opposite Kelsey's warehouse.

Latitude, 29° 29' N.; longitude, 98° 49' W. Elevation of barometer above sea-level, 230 (B) feet. Elevation of exposed thermometer above ground, 4 feet. Elevation of rain-gauge above ground, 2 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.		Total movement.			
	Washington time.					Monthly mean.					Washington time.					Self-registering thermometers.					Any 3 consecutive 8 hourly measurements.		Maximum hourly velocity during month.	Prevailing direction.				
	Date.			Lowest.	Date.	Range.			7 p. m.	8 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Date.	Amount.	L. p. m.	Date.				Miles.	Direction from—	Date.
	7 p. m.	8 p. m.	11 p. m.			High.	Low.	High.																				
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	
Jan.	30.068	30.094	30.078	30.065	30.021	29.959	16	332	44.2	60.6	51.5	53.1	23.0	30.21	3	64.0	65.8	40.5	0	0	0	47.40	15	16	N.W.	1	N.W.	
Feb.	30.049	30.019	30.085	30.044	30.043	30.040	15	773	57.7	77.5	64.4	64.5	92.0	26.32	15	163.2	80.2	53.5	0	0	0	00	28	28	N.W.	27	N.W.	
Mar.	30.075	30.077	30.074	30.076	30.076	30.076	14	688	62.1	88.3	70.3	75.1	98.2	17.32	0	168.2	88.6	53.4	0	0	0	15	15	20	N.W.	8	N.W.	
Apr.	30.075	30.068	30.077	30.071	30.071	30.071	14	638	62.1	88.3	70.3	75.1	101.6	19.45	0	20.3	88.7	65.0	0	0	0	15	15	20	N.W.	8	N.W.	
May	30.071	30.069	30.073	30.071	30.071	30.071	14	638	71.8	91.7	77.4	82.2	108.6	17.53	0	20.3	88.7	65.0	0	0	0	15	15	20	N.W.	8	N.W.	
June	30.074	30.072	30.073	30.073	30.073	30.073	14	638	71.8	91.7	77.4	82.2	108.6	17.53	0	20.3	88.7	65.0	0	0	0	15	15	20	N.W.	8	N.W.	
July	30.075	30.072	30.073	30.073	30.073	30.073	14	638	71.8	91.7	77.4	82.2	108.6	17.53	0	20.3	88.7	65.0	0	0	0	15	15	20	N.W.	8	N.W.	
Aug.	30.075	30.074	30.073	30.073	30.073	30.073	14	638	71.8	91.7	77.4	82.2	108.6	17.53	0	20.3	88.7	65.0	0	0	0	15	15	20	N.W.	8	N.W.	
Sept.	30.075	30.077	30.077	30.077	30.077	30.077	14	638	71.8	91.7	77.4	82.2	108.6	17.53	0	20.3	88.7	65.0	0	0	0	15	15	20	N.W.	8	N.W.	
Oct.	30.075	30.080	30.077	30.087	30.058	30.043	2	416	67.8	81.9	68.8	82.2	108.6	17.53	0	20.3	88.7	65.0	0	0	0	15	15	20	N.W.	8	N.W.	
Nov.	30.064	30.012	30.068	30.045	30.234	23	732	58.1	72.2	63.6	68.1	83.1	140.6	29.43	0	20.3	88.7	65.0	0	0	0	15	15	20	N.W.	8	N.W.	
Dec.	30.057	30.018	30.051	30.034	30.285	25	766	52.0	65.6	54.0	58.1	83.1	10.34	29.26	40.1	20.3	88.7	65.0	0	0	0	15	15	20	N.W.	8	N.W.	
Sum.	357.876	357.410	357.928	357.738	357.738	357.738	14	6,623	781.7	1,005.5	853.4	881.7	715.0	161.21	0	562.91	893.4707	613.94	0	0	0	15	15	20	N.W.	8	N.W.	
Means	30.052	30.074	30.057	30.051	30.051	30.051	14	552	65.1	83.8	71.5	77.5	110.0	16.21	0	44.9	88.6	64.0	0	0	0	15	15	20	N.W.	8	N.W.	

\*Two 7 a. m., two 8 p. m., and two 11 p. m. observations missed.

January.

April.

July.



## RIO GRANDE CITY, TEX.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).					Cloudiness (in tenths).					Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
													Washington time.					Clear.					Fair.					Cloudy.					On which .01 inch or more precipitation fell.					Maximum below 55°.					Minimum below 55°.					Maximum above 90°.					Thunderstorms.					Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 55°.	Minimum below 55°.	Maximum above 90°.	Thunderstorms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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\*Three observations in April missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.33 a. m., 1.33 p. m., and 9.33 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.003 inch.

The barometric observations may be reduced to sea level by adding the following constants for the various months: January, 0.250; February, 0.250; March, 0.240; April, 0.240; May, 0.230; June, 0.230; July, 0.230; August, 0.240; September, 0.240; October, 0.240; November, 0.250; December, 0.250.

REMARKS.—January 2, first and only frost during winter of 1883-'84. October 6, brilliant meteor 7.20 p. m. Office moved from Fort Ringgold to Rio Grande City October 31. Elevation of thermometer above ground changed from 5.695 feet to 4.000 feet; elevation of top of rain-gauge above ground changed from 1.133 feet to 1.672 feet.

L. G. SCHULTZ.

Private, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

ROCHESTER, N. Y.

Location of office on December 31, 1884, Powers building.

[Latitude, 43° 9' N.; longitude, 77° 49' W. Elevation of barometer above sea-level, 621 feet. Elevation of exposed thermometer above ground, 149 feet. Elevation of rain-gauge above ground, 145 feet.]

Barometer readings (corrected for temperature and instrumental error only).														Temperature.						Precipitation.		Wind.		Total movement.
Month.	Washington time.			Monthly mean.	Higbest.	Date.	Range.	Washington time.			Self-registering thermometers.				Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.	Maximum hourly velocity during month.		Prevailing direction.			
	7 p. m.	3 p. m.	11 p. m.					7 a. m.	8 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.					Date.	Absolute range.				
1884.																								
Jan.	29.402	29.390	29.377	29.380	30.140	27	1.568	17.3	20.2	17.4	18.347	0.30	31	10.6	5.13	1.24	W.	44	6	W.	11,714			
Feb.	29.346	29.336	29.326	29.340	29.029	15	2.058	25.4	23.8	24.9	26.347	5.3	5	18.5	1.94	.33	W.	17	8	W.	9,841			
Mar.	29.345	29.333	29.321	29.351	29.029	15	0.916	27.7	33.7	29.8	30.448	6	26	2.0	1.58	37.6	23.8	1	17	12	W.	9,500		
Apr.	29.254	29.243	29.233	29.244	29.739	31	1.685	37.5	44.4	40.9	41.173	3	27	27.8	5	47.7	43.2	33.9	2	32	WN	8,079		
May	29.274	29.264	29.254	29.269	29.603	8	1.885	50.4	59.6	52.7	54.282	3	33	30.4	48.3	67.1	56.1	23.1	0.0	2	SW	8,785		
June	29.453	29.442	29.432	29.447	29.837	15	.793	62.2	70.0	63.7	67.086	1	24	48.6	10	38.5	77.2	57.1	4	23	SW	8,042		
July	29.221	29.188	29.206	29.294	29.389	3	.492	62.0	70.0	63.3	65.179	0	1	48.0	16	41.0	73.2	57.7	3	18	W.	7,492		
Aug.	29.303	29.352	29.373	29.373	29.692	9	.758	61.7	74.7	65.8	67.492	2	20	42.8	25.4	0.1	77.7	53.5	2	32	SW	6,673		
Sept.	29.410	29.380	29.403	29.401	29.856	14	.834	60.0	71.4	63.0	64.892	1	7	37.8	19	54.3	76.6	54.1	1	30	SW	7,611		
Oct.	29.453	29.417	29.430	29.433	29.909	26	.909	48.2	55.7	49.7	51.284	1	4	24.0	26	60.1	61.8	43.8	1	32	SW	8,789		
Nov.	29.362	29.318	29.357	29.346	29.730	3	.965	34.0	40.6	35.8	36.849	9	10	15.4	24	48.5	44.5	30.8	1	7	SW	8,986		
Dec.	29.416	29.388	29.409	29.404	30.008	26	1.388	27.8	31.4	28.5	28.164	9	31	10.5	20	73.4	38.2	22.4	2	15	SW	6,888		
Sums	352.338	351.942	352.211	352.164	352.164	11.679	512.708	9,537.5	5,531.8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	188,798		
Means	29.362	29.328	29.351	29.347	30.140	27	.973	42.8	50.3	44.8	46.092	2	130	10.5	120	138.5	55.1	38.2	.....	.....	.....	.....		

\* Total for 164 days only. † For 351½ days. ‡ April. § August. ¶ December.

ROCHESTER, N. Y.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point			Relative humidity (per cent.).		Clearness (in tenths).				Number of days—											
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Washington time			Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Clear.	Partly.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.	Thunder-storms.	Anomalous.
										Mean.																			
										7 a. m.	3 p. m.	11 p. m.																	
1884.																													
Jan.....	8	8	5	6	23	35	7	0	0	13.4	13.7	11.0	0	12.7	84.4	76.4	76.0	72.1	8.2	7.8	7.9	8.2	31	0	0	0	0	0	0
Feb.....	8	8	10	10	14	7	23	12	0	21.6	22.5	19.9	21.3	21.3	85.1	78.4	81.7	82.7	9.2	7.6	6.7	7.8	24	0	0	0	0	0	0
Mar.....	8	8	7	13	5	11	26	30	0	22.7	24.8	23.0	23.5	23.5	81.1	71.4	75.9	76.1	9.9	6.8	6.2	6.5	13	0	0	0	0	0	0
Apr.....	5	18	4	4	6	6	12	34	1	31.0	29.9	31.8	30.9	30.9	77.7	60.3	72.0	70.0	7.0	6.9	5.6	6.5	0	0	0	0	0	0	0
May.....	6	9	4	11	9	20	23	11	0	42.4	42.4	44.0	42.9	42.9	74.8	55.8	73.3	68.0	6.5	7.5	4.6	6.2	0	0	0	0	0	0	0
June.....	7	19	6	6	6	26	10	5	2	54.7	55.6	55.4	55.2	55.2	76.7	56.4	70.5	67.9	4.9	4.9	3.0	3.8	0	0	0	0	0	0	0
July.....	9	6	4	2	7	13	38	14	0	53.5	53.9	55.4	54.9	54.9	79.5	58.9	76.4	71.6	6.8	7.0	3.2	4.1	0	0	0	0	0	0	0
Aug.....	7	11	1	4	11	33	17	8	1	53.6	55.4	56.4	55.8	55.8	80.8	52.6	72.4	68.6	8.9	4.8	3.6	4.1	0	0	0	0	0	0	0
Sept.....	10	8	0	8	9	42	13	9	1	52.7	53.7	54.6	53.7	53.7	77.9	56.2	75.2	69.8	5.6	6.3	4.5	5.5	6	0	0	0	0	0	0
Oct.....	9	2	6	8	13	23	20	13	1	41.2	42.2	42.0	41.8	41.8	77.8	62.5	77.0	72.4	7.2	7.5	4.8	6.5	0	0	0	0	0	0	0
Nov.....	2	1	6	8	6	29	24	13	1	28.4	31.5	30.3	30.1	30.1	72.2	80.8	77.7	77.7	9.3	8.4	6.9	8.4	0	0	0	0	0	0	0
Dec.....	2	4	2	15	13	28	22	6	1	22.6	24.6	23.4	23.5	23.5	82.5	76.5	81.3	80.1	9.3	8.6	6.9	8.5	10	0	0	0	0	0	0
Sums..	71	92	58	85	105	266	231	152	8	441.8	450.2	447.2	446.3	446.3	958.4	777.6	913.1	883.0	81.1	84.1	66.5	77.3	51	133	5	17	5	17	5
Means..	Percentages.																			Percentages.									
	62.1	8.4	5.3	7.7	9.6	24.2	23.8	13.8	.7	36.8	37.5	37.3	37.2	37.2	79.9	64.8	76.1	73.6	6.8	7.0	5.5	6.4	15.6	46.7	42.1	13.9	36.3	1.4	4.4

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.57 a. m., 2.57 p. m., and 10.57 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., March 31, inclusive, .000 inch; from 7 a. m., April 1, to 11 p. m., December 31, inclusive, +.022 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.719; February, 0.710; March, 0.700; April, 0.690; May, 0.680; June, 0.650; July, 0.650; August, 0.650; September, 0.680; October, 0.670; November, 0.700; December, 0.710.

REMARKS.—From 7 a. m., January 1, to 11 p. m., March 31, all barometer readings are too high, about .040 of an inch.

E. W. MCGANN,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

ROSEBURG, OREG.

Location of office on December 31, 1884, Jackson street, between Oak and Washington.

[Latitude, 43° 19' N.; longitude, 122° 20' W. Elevation of barometer above sea-level, 523 feet. Elevation of exposed thermometer above ground, 54 feet. Elevation of rain-gauge above ground, 46 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.				
	Washington time.					Washington time.					Self-registering thermometers.				Total amount.	Any 3 consecutive 8-hourly measurements.	Maximum hourly velocity during month.		Prevailing direction.	Total movement.			
	7 p. m.	3 p. m.	11 p. m.	Monthly mean.	Monthly mean.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Date.			Miles.	Direction.					
														Maximum.							Minimum.	Absolute range.	
1884.																							
Jan.	29.565	29.580	29.555	29.557	29.571	10	29.799	26	1.172	38.163.3	5	25.0	16	38.3	45.8	34.0	3.06	1.53	7, 8	28	SW.	8	W.
Feb.	29.457	29.469	29.448	29.458	29.838	23	29.699	17	1.159	38.469.0	23	22.2	13	38.7	47.4	30.3	3.71	1.74	15, 16	20	N.	6	N.W.
Mar.	29.378	29.383	29.370	29.375	29.754	19	29.795	9	9.939	45.757.3	8	28.2	8	45.8	55.6	37.4	8.37	0.85	8, 9	17	SW.	18	N.W.
Apr.	29.404	29.395	29.392	29.397	29.728	8	29.981	10	7.677	51.478.0	7	35.2	18	42.8	61.2	43.6	3.48	0.73	9, 10	28	N.	22	N.W.
May	29.472	29.447	29.435	29.451	29.699	1	29.134	19	5.535	56.683.2	31	35.0	4	63.2	71.8	48.6	0.85	0.68	25, 16	28	N.	22	N.W.
June.	29.418	29.400	29.412	29.410	29.651	24	29.146	21	4.885	61.084.3	17	42.7	27	41.2	72.5	51.9	1.90	0.42	25, 26	28	SW.	22	N.W.
July	29.500	29.492	29.464	29.485	29.616	19	29.225	13	3.91	63.486.5	30	43.3	4	43.2	75.1	52.9	1.06	0.05	0, 7	16	SW.	6	N.W.
Aug.	29.448	29.413	29.406	29.422	29.601	6	29.159	2	4.412	68.697.2	2	46.0	16	51.2	86.5	54.3	0.03	0.03	5, 41	N.E.	2	N.W.	N.W.
Sept.	29.500	29.492	29.464	29.485	29.616	19	29.225	13	3.91	63.486.5	30	43.3	4	43.2	75.1	52.9	1.06	0.05	0, 7	16	SW.	6	N.W.
Oct.	29.500	29.492	29.464	29.485	29.616	19	29.225	13	3.91	63.486.5	30	43.3	4	43.2	75.1	52.9	1.06	0.05	0, 7	16	SW.	6	N.W.
Nov.	29.500	29.492	29.464	29.485	29.616	19	29.225	13	3.91	63.486.5	30	43.3	4	43.2	75.1	52.9	1.06	0.05	0, 7	16	SW.	6	N.W.
Dec.	29.500	29.492	29.464	29.485	29.616	19	29.225	13	3.91	63.486.5	30	43.3	4	43.2	75.1	52.9	1.06	0.05	0, 7	16	SW.	6	N.W.
Sums	29.377	29.396	29.385	29.387	29.838	7	29.696	25	1.157	37.461.7	18	19.2	10	43.5	45.7	81.1	8.20	2.58	10, 17	...	...	...	N.W.
Means	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

\* One 3 p. m. and one 11 p. m. observation missed.

\* For 31 days only.

\* For 11 days only.

\* For 15 days only.



*Meteorological summary for the year ending December 31, 1884—Continued.*

SACRAMENTO, CAL.

Location of office on December 31, 1884, Lyon and Curtis Building.

[Latitude, 39° 25' N.; longitude, 121° 30' W. Elevation of barometer above sea-level, 64 feet. Elevation of exposed thermometer above ground, 26 feet. Elevation of rain-gauge above ground, 57 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.				Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	Washington time.					Monthly mean.					Self-registering ther- mometers.					Total amount.	Any 3 con- secutive 8-hourly measure- ments.	Maxima hourly velocity during month.	Prevailing direction.		Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	7 a. m.		3 p. m.		11 p. m.		Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.				Largest amount.	Date.		Miles.	Direction from—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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One 7 a. m. observation missed. One 11 p. m. observation missed. Inappreciable. January. February. August.

## SACRAMENTO, CAL.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Dew point.				Relative humidity (per cent.).				Cloudiness (in tenths).		Number of days—						River.						
	North.	Northeast.	South.	Southwest.	West.	Northwest.	Number of calms.		7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which more precipitation fell.	Minimum below 30°.	Maximum above 90°.	Highest.	Date.	Lowest.	Date.	Range.	Mean.			
1894.																							Pt. In.	Pt. In.	Pt. In.	Pt. In.	Pt. In.				
Jan.	20	4	26	12	1	17	8	38	42	40.7	80.1	73.4	80.0	80.8	13	10	8	9	2	0.13	6	81	7	10	5,23-28	5	8	9	1		
Feb.	31	3	12	14	6	13	1	38	40	41.9	80.7	70.8	78.6	79.7	16	15	7	10	6	0.17	7	18	10	1	15	7	6	13	1		
Mar.	22	2	12	14	17	4	8	2	44	45.4	45.2	80.7	68.2	74.1	76.5	13	7	10	13	0	0.23	6	13	14	0	8	4	8	6	20	
Apr.	4	0	5	16	25	28	5	6	1	47	48.1	49.5	68.2	62.5	74.5	13	7	10	9	0	0.23	6	20-22	19	9	9	7	8	3	9	21
May	3	0	0	14	31	30	2	13	0	51	53.1	81.4	55.7	69.8	69.0	18	5	6	7	0	0.22	10	122	0	31	0	10	22	3	3	
June	1	0	3	13	39	23	3	6	1	53	55.7	81.7	58.7	69.1	69.8	18	5	6	7	0	0.23	4	119	4	80	2	8	20	9	9	
July	0	0	0	21	35	22	3	11	1	52	54.9	73.0	47.6	57.7	59.4	18	5	6	7	0	0.23	4	111	6	31	7	10	14	10	10	
Aug.	1	0	0	18	33	31	2	7	1	54	56.0	58.0	58.9	60.8	60.8	18	5	6	7	0	0.23	4	111	6	31	7	10	14	10	10	
Sept.	1	0	0	20	23	20	5	18	1	49	52.0	52.3	51.2	48.7	63.4	18	5	6	7	0	0.23	4	111	6	31	7	10	14	10	10	
Oct.	20	1	1	20	14	3	14	6	46	50.9	51.7	58.8	72.5	71.2	63.4	18	5	6	7	0	0.23	4	111	6	31	7	10	14	10	10	
Nov.	27	5	2	9	10	14	4	6	13	44	47.2	46.1	85.5	65.7	71.7	13	8	10	11	5	0.34	7	24	30	0	2	7	11	8	8	
Dec.	18	2	3	30	17	7	2	13	1	38	2	39.4	39.2	68.2	71.1	13	8	10	11	5	0.34	7	24	30	0	2	7	11	8	8	
Sums	149	18	220	267	213	38	132	36	558	7592	7594	7522	6838	6843	731.539	423.932	238	68	57	69	13	23	.....	61	.....	.....	.....	.....	.....	.....	.....
Percentages.																															
13.61 9.2 0.20 174.4 19.4 5.12 1.3 45.6 49.4 49.5 82.0 70.7 70.7 70.7 70.7 70.7 2.65 6.13 7.15 9.3 6.6 0.34 7 27 7 6 -8-17 5 1 14 2																															

## \* December.

NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond to 4.02 a. m., 12.02 p. m., and 8.02 p. m. local time. Corrections for instrumental error of barometer used: From 7 a. m., January 1, to 3 p. m., July 21, inclusive, — .001 inch. From 7 p. m., July 21, to 11 p. m., December 31, 1894, inclusive, — .003. (Extra barometer 244 used as station barometer on and after the 7 p. m. observation July 21.)

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.070; February, 0.070; March, 0.070; April, 0.070; May, 0.070; June, 0.070; July, 0.070; August, 0.070; September, 0.070; October, 0.070; November, 0.070; December, 0.070.

REMARKS.—Barometer reduction: Constant changed on and after February 1 from 0.080 to 0.070 of an inch for all months. Officers moved from Arcade Building, 1008 Second Street, to Lyon & Curtis Building, 117 I street, after the 11 p. m. observation of January 31, and before the 7 a. m. observation of February 1. Change in elevation of instruments as follows, viz: Barometer cliner, old elevation, 67.64 feet; new elevation, 63.31 feet; thermometer standard, old elevation, 37.10 feet; new elevation, 32.07 feet; rain-gauge elevation, 57.98 feet; new elevation, 56.65 feet. Old elevation used during January; new elevation used from February to date. Last killing frost, February 14; last light frost March 30; first killing frost December 9; first light frost October 1.

JAMES A. BARWICK, *Sergeant, Signal Corps, U. S. A.*

*Meteorological summary for the year ending December 31, 1884—Continued.*

SAINT LOUIS, MO.

Location of office on December 31, 1884, United States custom-house.

[Latitude, 38° 39' N., longitude, 90° 12' W. Elevation of barometer above sea-level, 571 feet. Elevation of exposed thermometer above ground, 70 feet. Elevation of rain-gauge above ground, 90 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.					Precipitation.			Wind.			Total movement.			
Washington time.					Washington time.					Self-registering thermometer.					Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.					
7 p. m.	3 p. m.	11 p. m.	Range.	Date.	Lowest.	Highest.	Monthly mean.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.		Direction from—	Date.	Miles.
1884.																								
Jan.	29.618	29.585	29.621	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608
Feb.	29.443	29.412	29.436	29.436	29.436	29.436	29.436	29.436	29.436	29.436	29.436	29.436	29.436	29.436	29.436	29.436	29.436	29.436	29.436	29.436	29.436	29.436	29.436	29.436
Mar.	29.408	29.385	29.410	29.401	29.792	29.792	29.792	29.792	29.792	29.792	29.792	29.792	29.792	29.792	29.792	29.792	29.792	29.792	29.792	29.792	29.792	29.792	29.792	29.792
Apr.	29.387	29.320	29.326	29.328	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608
May.	29.366	29.314	29.332	29.354	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608	29.608
June.	29.410	29.373	29.387	29.390	29.515	29.515	29.515	29.515	29.515	29.515	29.515	29.515	29.515	29.515	29.515	29.515	29.515	29.515	29.515	29.515	29.515	29.515	29.515	29.515
July.	29.348	29.324	29.334	29.335	29.558	29.558	29.558	29.558	29.558	29.558	29.558	29.558	29.558	29.558	29.558	29.558	29.558	29.558	29.558	29.558	29.558	29.558	29.558	29.558
Aug.	29.468	29.439	29.451	29.453	29.708	29.708	29.708	29.708	29.708	29.708	29.708	29.708	29.708	29.708	29.708	29.708	29.708	29.708	29.708	29.708	29.708	29.708	29.708	29.708
Sept.	29.448	29.404	29.423	29.425	29.680	29.680	29.680	29.680	29.680	29.680	29.680	29.680	29.680	29.680	29.680	29.680	29.680	29.680	29.680	29.680	29.680	29.680	29.680	29.680
Oct.	29.560	29.519	29.534	29.538	29.837	29.837	29.837	29.837	29.837	29.837	29.837	29.837	29.837	29.837	29.837	29.837	29.837	29.837	29.837	29.837	29.837	29.837	29.837	29.837
Nov.	29.526	29.482	29.507	29.508	29.841	29.841	29.841	29.841	29.841	29.841	29.841	29.841	29.841	29.841	29.841	29.841	29.841	29.841	29.841	29.841	29.841	29.841	29.841	29.841
Dec.	29.535	29.496	29.513	29.512	29.856	29.856	29.856	29.856	29.856	29.856	29.856	29.856	29.856	29.856	29.856	29.856	29.856	29.856	29.856	29.856	29.856	29.856	29.856	29.856
Sums	353.457	353.085	353.294	353.279	353.279	353.279	353.279	353.279	353.279	353.279	353.279	353.279	353.279	353.279	353.279	353.279	353.279	353.279	353.279	353.279	353.279	353.279	353.279	353.279
Means	29.456	29.424	29.441	29.440	29.440	29.440	29.440	29.440	29.440	29.440	29.440	29.440	29.440	29.440	29.440	29.440	29.440	29.440	29.440	29.440	29.440	29.440	29.440	29.440

January.

March.

June.



## SAINT LOUIS, MO.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—							River.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	Number of calms.								7 a. m.		3 p. m.		11 p. m.		Mean.		7 a. m.		3 p. m.		11 p. m.		Mean.		Clear.		Fair.		Cloudy.		On which .01 inch or more precipitation fell.		Minimum below 32°.		Maximum above 80°.		Thunder-storms.		Highest.		Date.		Lowest.		Date.		Range.		Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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	North.		Northeast.		Southeast.		South.		Southwest.		West.		Northwest.		North.		Northeast.		Southeast.		South.		Southwest.		West.		Northwest.		North.		Northeast.		Southeast.		South.		Southwest.		West.		Northwest.		North.		Northeast.		Southeast.		South.		Southwest.		West.		Northwest.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
1884.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Sums.	1885.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Sums.	1886.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Sums.	1887.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Sums.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
18	4	1	7	24	12	11	16	0	16.3	20.0	17.3	17.9	77.6	69.9	71.0	72.8	4.4	5.5	5.5	5.1	0	12.9	14.2	13.6	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11

\* April.

\* January.

NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond to 6:07 a. m., 2:07 p. m., and 10:07 p. m. local time. Correction for instrumental error of barometer used. From 6:07 a. m. January 1, to 10:07 p. m. December 31, 1884, inclusive.—.010 inch. The barometric observations may be reduced to sea level by adding the following constants for the various months: January, 0.650; February, 0.650; March, 0.640; April, 0.620; May, 0.600; June, 0.590; July, 0.590; August, 0.590; September, 0.600; October, 0.610; November, 0.640; December, 0.650.

REMARKS.—Lunar corona visible from 7:30 p. m., to 8:30 p. m., January 9; February 17, heavy rain, accompanied by hail, fell from 11:20 to 11:25 a. m.; March, hail fell on 26th; April, last snow of season on 8th; thunder-storm on 30th; May, hail fell on 3th, thunder-storm on 18th; June, thunder-storms on 2d, 8th, and 24th; July, thunder-storms on the 7th, 8th, 13th, and 16th. Rainbow on 26th; August, thunder-storms on 26th and 21st; September, thunder-storms, 11th, 16th, 24th, and 26th; October, heavy frosts in suburbs on 23d; November, heavy frosts in suburbs on 5th, 6th, and 20th. December, first snow on 18th.

G. A. WEBER,  
Corporal, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

SAINT MICHAEL'S, FORT, ALASKA.

[Latitude, 49° 29' N.; longitude, 161° 49' W. Elevation of barometer above sea-level, 80 feet. Elevation of exposed thermometer above ground, 18 feet. Elevation of rain-gauge above ground, 1 foot.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.															
Month.	Washington time.			Monthly mean.	High.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering ther- mometers.				Total amount.	Any 3 con- secutive 8-hourly measure- ments.	Maximum hourly velocity during month.		Prevailing direction.	Total movement.										
	7 p. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.			Absolute range.	Mean maximum.			Mean minimum.	Largest amount.	Date.	Miles.	Direction from—	Date.				
1884.																																	
Jan.	29.697	29.708	29.697	29.701	30.648	31	20.01621	1.629	8	4.6	4.0	2.189	28	38.0	24	77.0	11.9	0	2.5	57.12	17	13	NE	2,251									
Feb.	29.136	29.129	29.114	29.120	30.637	1	20.09423	1.543	9.4	12.1	14.2	11.927	27	38.0	1	63.0	19.8	4.4	8.8	78.06	26	63	SW	2,201									
Mar.	29.720	29.720	29.705	29.715	30.179	7	20.06281	1.963	12.4	13.3	15.5	13.743	8	10.0	28	53.5	20.0	6.8	78.23	23	68	NE	2,208										
Apr.	29.929	29.929	29.948	29.953	30.498	7	20.39890	1.100	20.8	23.4	25.5	22.041	8	10.0	28	53.5	20.0	6.8	78.23	23	68	NE	9,486										
May	29.741	29.752	29.748	29.745	30.204	21	20.33118	.873	31.2	35.4	37.2	34.532	30	11.0	8	41.0	40.7	28.0	16.7	77.21	19	30	W	4,695									
June	29.850	29.862	29.845	29.853	30.208	22	20.26022	.744	44.2	47.8	50.1	47.430	6	31.0	8	23.5	54.1	40.5	25.1	77.21	21	38	W	6,915									
July	29.848	29.847	29.816	29.838	30.193	12	20.50819	.695	53.4	53.7	53.6	52.567	31	44.0	8	23.5	54.1	40.5	48.2	4.00	68	4	44	N	7,843								
Aug.	29.818	29.824	29.810	29.820	30.193	12	20.32938	.748	53.4	53.7	53.6	53.577	31	44.0	8	23.5	54.1	40.5	49.7	1.40	55	5	44	N	8,515								
Sept.	29.738	29.756	29.754	29.756	30.152	8	20.14114	1.011	33.8	40.8	44.9	40.430	13	18.0	31	37.5	60.9	45.0	36.5	5.04	155	19	20	SW	10,521								
Oct.	29.738	29.800	29.797	29.797	30.428	1	21.28760	1.466	22.2	21.6	23.1	22.3	5	0.0	23	42.0	43.5	16.2	16.2	1.46	95	1	70	SW	8,321								
Nov.	29.648	29.652	29.635	29.633	30.544	80	20.85940	1.297	16.6	16.2	16.3	16.384	20	29	23	42.0	43.5	16.2	16.2	1.46	95	1	70	SW	10,521								
Dec.	29.863	29.830	29.860	29.838	30.577	10	20.28729	1.846	12.7	13.6	13.4	13.242	13	30.0	14	62.0	30.3	6.0	60	20	48	NE	10,487										
Sums	357.799	357.873	357.716	357.797	364.648	(*)	25.739	14.067	312.0	337.5	332.4	332.42	(*)	33.0	562	5498	2633	216.50	(*)	57.12	17	13	NE	90,009									
Means	29.818	29.823	29.816	29.816	30.648	(*)	25.739	1.172	26.1	28.1	28.4	27.506	(*)	33.0	60.9	54.0	31.5	21.6	(*)	57.12	17	13	NE	90,009									
* For 9 days only.																								* For 13 days only.		* For 237 days only.		* January.		* December.		* August.	

1 For 8 days only.

2 For 13 days only.

3 For 27 days only.

4 January.

5 December.

6 August.

## SAINT MICHAEL'S, FORT, ALASKA—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—							Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Washington time.				Clondiness (in tenths).		Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
										7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 1.21 a. m., 9.21 a. m., and 5.21 p. m., local time.

Corrections for instrumental error of barometer used: From 1.21 a. m., January 1, to 5.21 p. m., December 31, 1885, inclusive, + .027 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.4; February, 0.4; March, 0.4; April, 0.3; May, 0.3; June, 0.3; July, 0.3; August, 0.3; September, 0.3; October, 0.3; November, 0.3; December, 0.4.

FRED. H. CLARKE,  
Corporal, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

SAINT PAUL, MINN.

Location of office on December 31, 1884, Presley Block, No. 104 East Third street.

[Latitude, 44° 58' N.; longitude, 93° 3' W. Elevation of barometer above sea-level, 801 feet. Elevation of exposed thermometer above ground, 44 feet. Elevation of rain-gauge above ground, 61 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.					Precipitation.			Wind.										
Month.	Washington time.			Monthly mean.	Highest.	Lowest.	Range.	Washington time.			Self-registering thermometers.			Mean maximum.	Mean minimum.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.	Total movement							
	7 P. M.	3 P. M.	11 P. M.					Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.	Date.			Miles.	Direction from—	Date.	Total amount.			Largest amount.	Date.	Miles.	Direction			
1884.	<i>I<sub>h</sub></i>	<i>I<sub>m</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>m</sub></i>	<i>I<sub>h</sub></i>	<i>I<sub>l</sub></i>	<i>I<sub>r</sub></i>	7 P. M.	3 P. M.	11 P. M.	Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction	Date.	Miles.	Direction	Total movement		
Jan.....	28.272	28.239	28.254	28.255	28.756	5 28.498	13 1.258	7.9	7.945	29—31.5	4	76.5	20.8	3.0	.49	9.10	24	SE.	27	W.	4,233							
Feb.....	28.166	28.144	28.159	28.157	28.634	15 28.502	18 1.152	7.2	13.9	13.345	16—18.0	15	63.0	24.4	1.6	1.27	4.5	27	S.	18	NW.	4,401						
Mar.....	28.128	28.118	28.136	28.127	28.536	13 28.172	11 1.364	21.8	28.1	28.259	28—12.0	4	71.5	37.7	18.4	1.34	42	18, 19	34	SE.	5,091							
Apr.....	28.109	28.074	28.096	28.093	28.686	21 28.408	27 1.278	38.8	44.5	44.471	5 25	21.9	49.6	58.0	37.6	2.00	70	27	SE.	29	NW.	7,470						
May.....	28.090	28.054	28.064	28.069	28.525	28 28.753	22 1.772	51.9	68.6	68.031	9 34.0	2	47.0	69.9	48.9	2.09	76	22	NW.	18	NW.	5,553						
June.....	28.164	28.133	28.138	28.145	28.418	14 28.895	24 1.523	63.8	68.7	68.790	24 47.5	2	42.5	80.6	60.4	3.57	143	7	32	NW.	30	SE.	5,078					
July.....	28.074	28.050	28.048	28.057	28.344	20 28.784	23 1.560	63.0	68.3	68.288	2 51.5	6	38.5	80.5	60.2	2.93	1.03	29	NW.	24	W.	4,632						
Aug.....	28.132	28.104	28.106	28.114	28.478	8 28.824	29 1.054	62.4	67.8	68.980	15 49.5	4	40.0	79.5	59.6	2.99	1.29	24, 25	46	SE.	19	SE.	6,190					
Sept.....	28.064	28.032	28.037	28.051	28.496	12 28.685	2 1.801	57.6	62.2	63.687	5 43.5	20	43.5	73.1	54.6	4.48	1.88	8, 9	23	SW., NW., S.	10, 11, 12	SE.	5,694					
Oct.....	28.170	28.145	28.162	28.159	28.374	14 28.665	5 1.009	46.7	57.7	51.881	2 22.0	23	58.0	61.5	43.4	2.43	.93	1, 2	27	W, SE.	5, 25	NW.	6,051					
Nov.....	28.206	28.189	28.205	28.200	28.563	5 28.736	26 1.827	38.4	31.7	31.960	8 14—	5.8	24	68.6	41.3	23.9	.65	40	22	NW.	167	NW.	2,976					
Dec.....	28.222	28.197	28.221	28.213	28.626	25 28.673	8 1.153	12.1	14.2	14.848	2 3—	27.0	22.7	7.0	1.98	.54	6, 7	30	W.	8	NW.	5,522						
Sums	249,800	349,479	349,646	349,640	440,000	11 251,455	6 599.6	518.6	524.7	—	—	—	870.9	943.9	412.6	26.11	—	—	—	—	—	63,111						
Means	28.150	28.123	28.137	28.137	28.826	23 28.172	11 1.038	50.0	43.2	43.790	0 124	—	55.9	64.0	34.4	—	—	—	—	—	—	NW.	—					
																							! March.		! June.		! January	

\* December.

† March.

‡ June.

§ January.

## SAINT PAUL, MINN.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—								Dew-point.				Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—								River.						
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 82°.	Minimum below 82°.	Thunderstorms.	Auroras.	Highest.	Date.	Lowest.	Date.	Range.	Mean.
Washington time.																															

\* For 8 days only.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.56 a. m., 1.56 p. m., and 9.56 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.017 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.940; February, 0.930; March, 0.910; April, 0.880; May, 0.840; June, 0.840; July, 0.830; August, 0.830; September, 0.850; October, 0.870; November, 0.910; December, 0.950.

REMARKS.—April 21, last frost of the season; October 9, first light frost of the season; October 22, first killing frost of the season; October 22, first snow of the season. P. F. LYONS, Sergeant, Signal Corps, U. S. A.

*Metereological summary for the year ending December 31, 1884—Continued.*

SAINT VINCENT, MINN.

Location of office on December 31, 1884, west end of village.

[Latitude, 49° 50' N.; longitude, 97° 14' W. Elevation of barometer above sea-level, 804 feet. Elevation of exposed thermometer above ground, 8 feet. Elevation of rain gauge above ground, 14 feet.]

Month.	Barometric readings (corrected for temperature and instrumental error only).						Temperature.						Precipitation.				Wind.			Total movement.															
	Washington time.			Highest.			Lowest.			Range.			Washington time.			Self-registering thermometers.			Mean maximum.		Mean minimum.		Total amount.		Largest amount.		Date.		Any 3 consecutive hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.		
	7 p. m.	3 p. m.	11 p. m.	In.	In.	In.	Date.	Date.	In.	In.	In.	In.	7 p. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Date.	Abnormal range.	Maximum.	Minimum.	Date.	Miles.	Direction from—	Date.	Miles.	Direction from—	Maximum hourly velocity during month.	Prevailing direction.	Miles.				
1884.																																			
Jan.	28.232	28.235	28.278	28.278	28.278	28.278	28.278	28.278	28.278	28.278	28.278	28.278	28.278	28.278	28.278	28.278	28.278	28.278	28.278	28.278	28.278	28.278	28.278	28.278	28.278	28.278	28.278	28.278	28.278	28.278	28.278	28.278	28.278	28.278	28.278
Feb.	28.206	28.231	28.251	28.249	28.249	28.249	28.249	28.249	28.249	28.249	28.249	28.249	28.249	28.249	28.249	28.249	28.249	28.249	28.249	28.249	28.249	28.249	28.249	28.249	28.249	28.249	28.249	28.249	28.249	28.249	28.249	28.249	28.249	28.249	28.249
Mar.	29.143	29.143	29.134	29.140	29.140	29.140	29.140	29.140	29.140	29.140	29.140	29.140	29.140	29.140	29.140	29.140	29.140	29.140	29.140	29.140	29.140	29.140	29.140	29.140	29.140	29.140	29.140	29.140	29.140	29.140	29.140	29.140	29.140	29.140	29.140
Apr.	29.196	29.173	29.185	29.185	29.185	29.185	29.185	29.185	29.185	29.185	29.185	29.185	29.185	29.185	29.185	29.185	29.185	29.185	29.185	29.185	29.185	29.185	29.185	29.185	29.185	29.185	29.185	29.185	29.185	29.185	29.185	29.185	29.185	29.185	29.185
May.	29.131	29.097	29.098	29.109	29.109	29.109	29.109	29.109	29.109	29.109	29.109	29.109	29.109	29.109	29.109	29.109	29.109	29.109	29.109	29.109	29.109	29.109	29.109	29.109	29.109	29.109	29.109	29.109	29.109	29.109	29.109	29.109	29.109	29.109	29.109
June.	29.092	29.075	29.071	29.079	29.079	29.079	29.079	29.079	29.079	29.079	29.079	29.079	29.079	29.079	29.079	29.079	29.079	29.079	29.079	29.079	29.079	29.079	29.079	29.079	29.079	29.079	29.079	29.079	29.079	29.079	29.079	29.079	29.079	29.079	29.079
July.	29.039	29.033	29.043	29.045	29.045	29.045	29.045	29.045	29.045	29.045	29.045	29.045	29.045	29.045	29.045	29.045	29.045	29.045	29.045	29.045	29.045	29.045	29.045	29.045	29.045	29.045	29.045	29.045	29.045	29.045	29.045	29.045	29.045	29.045	29.045
Aug.	29.062	29.018	29.048	29.052	29.052	29.052	29.052	29.052	29.052	29.052	29.052	29.052	29.052	29.052	29.052	29.052	29.052	29.052	29.052	29.052	29.052	29.052	29.052	29.052	29.052	29.052	29.052	29.052	29.052	29.052	29.052	29.052	29.052	29.052	29.052
Sept.	29.095	29.054	29.082	29.077	29.077	29.077	29.077	29.077	29.077	29.077	29.077	29.077	29.077	29.077	29.077	29.077	29.077	29.077	29.077	29.077	29.077	29.077	29.077	29.077	29.077	29.077	29.077	29.077	29.077	29.077	29.077	29.077	29.077	29.077	29.077
Oct.	29.115	29.081	29.089	29.095	29.095	29.095	29.095	29.095	29.095	29.095	29.095	29.095	29.095	29.095	29.095	29.095	29.095	29.095	29.095	29.095	29.095	29.095	29.095	29.095	29.095	29.095	29.095	29.095	29.095	29.095	29.095	29.095	29.095	29.095	29.095
Nov.	29.212	29.114	29.209	29.205	29.206	29.206	29.206	29.206	29.206	29.206	29.206	29.206	29.206	29.206	29.206	29.206	29.206	29.206	29.206	29.206	29.206	29.206	29.206	29.206	29.206	29.206	29.206	29.206	29.206	29.206	29.206	29.206	29.206	29.206	29.206
Dec.	29.240	29.244	29.250	29.251	29.251	29.251	29.251	29.251	29.251	29.251	29.251	29.251	29.251	29.251	29.251	29.251	29.251	29.251	29.251	29.251	29.251	29.251	29.251	29.251	29.251	29.251	29.251	29.251	29.251	29.251	29.251	29.251	29.251	29.251	29.251
Sums.	249.803	249.630	249.656	249.665	249.665	249.665	249.665	249.665	249.665	249.665	249.665	249.665	249.665	249.665	249.665	249.665	249.665	249.665	249.665	249.665	249.665	249.665	249.665	249.665	249.665	249.665	249.665	249.665	249.665	249.665	249.665	249.665	249.665	249.665	249.665
Means.	29.150	29.128	29.136	29.139	29.139	29.139	29.139	29.139	29.139	29.139	29.139	29.139	29.139	29.139	29.139	29.139	29.139	29.139	29.139	29.139	29.139	29.139	29.139	29.139	29.139	29.139	29.139	29.139	29.139	29.139	29.139	29.139	29.139	29.139	29.139

\* February.

† June.

‡ December.

## SAINT VINCENT, MINN.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point		Relative humidity (per cent.).		Cloudiness (in tenths).					Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Washington time.			Cloudiness (in tenths).					Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
										7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Part.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 25°.	Minimum below 35°.	Maximum above 90°.	Thunder-storms.	Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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*Meteorological summary for the year ending December 31, 1884—Continued.*

SALT LAKE CITY, UTAH.

Location of office on December 31, 1884, Wasatch building, southeast corner of Main and Second South streets.

[Latitude, 40° 48' N.; longitude, 111° 54' W. Elevation of barometer above sea-level, 4,348 feet. Elevation of exposed thermometer above ground, 53 feet. Elevation of rain-gauge above ground, 78 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.							Precipitation.			Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	Washington time.			Monthly mean.			Range.	Washington time.			Self-registering thermometers.				Total amount.	Any 8 consecutive 8-hourly measurements.	Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	7 a. m.	3 p. m.	11 p. m.	In.	W.	Lowest.		Date.	Highest.	In.	W.	Mean.	Date.				Minimum.	Absolute range.		Mean maximum.	Mean minimum.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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\* January.

† February.

‡ July.



## SALT LAKE CITY, UTAH.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.			Washington time.						Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
									North.	Northeast.	Southwest.	West.	Northwest.	7 a. m.	3 p. m.	11 p. m.	Mean.										7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
1884.	Jan.....	Feb.....	Mar.....	Apr.....	May.....	June.....	July.....	Aug.....	Sept.....	Oct.....	Nov.....	Dec.....	Suma..	Percentages.	Means.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.41 a. m., 12.41 p. m., and 8.41 p. m., local time.

Correction for instrumental error of barometer used: From 1.41 a. m., January 1, to 8.41 p. m., December 31, 1884, inclusive, +.012 inch.

The barometer observations may be reduced to sea level by adding the following constants for the various months: January, 4.570; February, 4.560; March, 4.590; April, 4.570; May, 4.520; June, 4.520; July, 4.580; August, 4.590; September, 4.550; October, 4.540; November, 4.570; December, 4.540.

REMARKS.—January, two lunar halos during month; February 13, thermometer 13° below zero; snow-slide at Park City, Utah; three lives lost. March, snow-slide at Alta, Utah, 7th; twelve lives lost. April, high wind 25th. May, floods during month throughout Territory. June, floods during month throughout Territory. September, first light frost of season 10th; snow on mountains 7th. November, first heavy frost of season, 3d. December, lowest monthly mean barometer for December recorded.

JOHN CRAIG,  
Sergeant, Signal Corps, U. S. A.



SAN DIEGO, CAL.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).					Number of days—									
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.			Washington time.						Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunderstorms.	Aurora.	
									7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.										3 p. m.
1885.																											
Jan.....	10	27	10	6	8	9	17	0	37.5	40.4	43.4	67.3	43.6	72.8	62.9	2.5	3.7	3.9	3.4	5	6	0	0	0	0		
Feb.....	6	13	5	9	11	8	16	4	44.2	45.8	47.6	77.1	60.0	78.5	71.9	5.5	6.5	3.9	5.3	9	15	0	0	0	0		
Mar.....	3	14	7	4	18	1	27	19	47.1	48.9	48.9	88.4	63.0	78.4	75.5	6.0	6.2	4.4	5.9	16	16	0	0	0	0		
Apr.....	17	6	5	2	5	8	24	21	50.1	51.9	51.1	82.9	68.0	82.6	79.7	6.4	5.4	4.4	5.4	3	6	0	0	0	0		
May.....	10	5	6	3	7	3	32	27	54.5	55.2	55.1	88.9	63.7	83.0	80.4	7.3	5.5	5.4	6.3	2	19	0	0	0	0		
June.....	10	0	3	2	3	0	27	1	54.5	57.1	57.8	88.6	64.0	82.4	78.3	6.2	4.9	5.4	5.5	12	10	0	0	0	0		
July.....	9	0	1	3	3	0	20	2	60.2	61.8	61.5	88.9	62.5	83.1	77.8	6.6	1.3	3.1	3.8	4	4	0	0	0	0		
Aug.....	9	3	1	3	3	0	20	2	61.1	62.3	62.1	88.2	64.1	81.0	78.5	6.6	1.5	2.7	3.6	10	4	0	0	0	0		
Sept.....	10	4	2	3	3	0	20	2	55.3	57.6	57.0	84.6	61.0	78.5	74.7	4.2	1.4	3.0	3.1	17	0	0	0	0	0		
Oct.....	10	8	2	3	3	0	23	2	52.3	56.6	56.3	86.4	63.7	81.7	77.8	3.5	2.4	3.1	3.0	18	9	0	0	0	0		
Nov.....	10	13	8	3	3	0	23	2	47.9	52.2	51.4	83.1	61.3	86.9	77.1	4.5	1.4	1.4	2.3	18	14	0	0	0	0		
Dec.....	11	7	11	5	7	5	27	15	44.6	47.6	48.4	82.8	66.1	83.9	77.6	3.8	4.7	4.7	3.1	5	13	0	0	2	0		
Sums ..	129	117	63	36	90	98	292	259	611.4	634.3	638.3	1007.4	753.2	973.3	911.5	65.0	44.9	47.8	52.7	117	182	67	81	0	4		
Percentages.																											
Means ..	11.7	10.7	5.7	3.3	7.3	8.9	26.6	23.6	51.0	53.9	53.2	84.0	82.8	81.1	76.0	5.4	3.7	4.0	4.4	32.0	49.7	18.3	22.1	0	0	0.31	1.0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.20 a. m., 12.20 p. m., and 8.20 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, —.020 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.070; February, 0.070; March, 0.070; April, 0.070; May, 0.070; June, 0.070; July, 0.070; August, 0.070; September, 0.070; October, 0.070; November, 0.070; December, 0.070.

REMARKS.—March 25, last frost of season; March 26, hail-storm; April 27, hail-storm; October 22, desert wind; December 13, killing frost, first of season; no injury to crops.

J. C. SPRIGG, JR.,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

SANDUSKY, OHIO.

Location of office on December 31, 1884, corner Water and Columbus streets.

[Latitude, 41° 20' N.; longitude, 82° 40' W. Elevation of barometer above sea-level, 639 feet. Elevation of exposed thermometer above ground, 54 feet. Elevation of rain-gauge above ground, 66 feet.]

Barometer readings (corrected for temperature and instrumental error only).										• Temperature.					Precipitation.			Wind.								
Month.	Washington time.				Monthly mean.	Highest.	Lowest.	Range.	Washington time.				Self-registering thermometer.			Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.	Maximum hourly velocity during month.		Prevailing direction.	Total movement.			
	7 a. m.	9 p. m.	11 p. m.	Monthly mean.					7 a. m.	9 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Date.					Absolute range.	Date.			Miles.	Direction.	Date.
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.				
Jan.....	29.433	29.386	29.450	29.426	30.044	29.750	29.750	29.750	29.750	29.750	29.750	29.750	29.750	29.750	29.750	29.750	29.750	29.750	29.750	29.750	29.750	29.750				
Feb.....	29.344	29.324	29.352	29.333	29.638	29.638	29.638	29.638	29.638	29.638	29.638	29.638	29.638	29.638	29.638	29.638	29.638	29.638	29.638	29.638	29.638	29.638				
Mar.....	29.349	29.325	29.335	29.336	29.772	29.772	29.772	29.772	29.772	29.772	29.772	29.772	29.772	29.772	29.772	29.772	29.772	29.772	29.772	29.772	29.772	29.772				
Apr.....	29.281	29.238	29.253	29.251	29.664	29.664	29.664	29.664	29.664	29.664	29.664	29.664	29.664	29.664	29.664	29.664	29.664	29.664	29.664	29.664	29.664	29.664				
May.....	29.285	29.255	29.271	29.270	29.640	29.640	29.640	29.640	29.640	29.640	29.640	29.640	29.640	29.640	29.640	29.640	29.640	29.640	29.640	29.640	29.640	29.640				
June.....	29.405	29.371	29.369	29.362	29.706	29.706	29.706	29.706	29.706	29.706	29.706	29.706	29.706	29.706	29.706	29.706	29.706	29.706	29.706	29.706	29.706	29.706				
July.....	29.243	29.222	29.225	29.230	29.455	29.455	29.455	29.455	29.455	29.455	29.455	29.455	29.455	29.455	29.455	29.455	29.455	29.455	29.455	29.455	29.455	29.455				
Aug.....	29.383	29.342	29.356	29.360	29.625	29.625	29.625	29.625	29.625	29.625	29.625	29.625	29.625	29.625	29.625	29.625	29.625	29.625	29.625	29.625	29.625	29.625				
Sept.....	29.407	29.363	29.369	29.366	29.767	29.767	29.767	29.767	29.767	29.767	29.767	29.767	29.767	29.767	29.767	29.767	29.767	29.767	29.767	29.767	29.767	29.767				
Oct.....	29.470	29.430	29.439	29.446	29.626	29.626	29.626	29.626	29.626	29.626	29.626	29.626	29.626	29.626	29.626	29.626	29.626	29.626	29.626	29.626	29.626	29.626				
Nov.....	29.381	29.354	29.363	29.376	29.743	29.743	29.743	29.743	29.743	29.743	29.743	29.743	29.743	29.743	29.743	29.743	29.743	29.743	29.743	29.743	29.743	29.743				
Dec.....	29.420	29.382	29.435	29.412	29.923	29.923	29.923	29.923	29.923	29.923	29.923	29.923	29.923	29.923	29.923	29.923	29.923	29.923	29.923	29.923	29.923	29.923				
Sum.....	302.381	302.011	302.352	302.208	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....				
Means ..	29.363	29.324	29.363	29.351	30.044	29.726	29.655	29.655	29.655	29.655	29.655	29.655	29.655	29.655	29.655	29.655	29.655	29.655	29.655	29.655	29.655	29.655				
																							August.		9 December.	

\* January.

† April.

‡ August.

§ December.

## SANDUSKY, OHIO—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Washington time.				Mean.		7 a. m.	3 p. m.	11 p. m.	Mean.	On which .01 inch or more precipitation fell.				Cloudy.	Fair.	Clody.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.38 a. m., 2.38 p. m., and 10.38 p. m., local time. Correction for instrumental error of barometer used: From 6.38 a. m., January 1, to 10.38 p. m., December 31, 1884, inclusive, —.011 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.720; February, 0.720; March, 0.720; April, 0.700; May, 0.670; June, 0.670; July, 0.670; August, 0.660; September, 0.670; October, 0.690; November, 0.720; December, 0.730.

B. F. HOUTGH.  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

SANDY HOOK, N. J.

Location of office on December 31, 1884, Atlantic and Pacific Telegraph Company's building.

[Latitude, 40° 29' N.; longitude, 74° 0' W. Elevation of barometer above sea level, 28 feet. Elevation of exposed thermometer above ground, 16 feet. Elevation of rain-gauge above ground, 1 foot.]

Barometer readings (corrected for temperature and instrumental error only).														Temperature.							Precipitation.				Wind.				
Month.	Washington time.				Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.				Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.	Miles.	Direction.	Maximum hourly velocity during month.	Date.	Prevailing direction.	Total movement.		
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.						Maximum.	Minimum.	Date.	Absolute range.																
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Lat.	Long.	Date.	Lat.	Long.	Lat.	Long.			
Jan.	30.142	30.089	30.113	30.115	30.832	27.23.116	9	1.716	25.5	29.9	27.6	27.7	50.0	9	8.0	6.7	42.0	33.6	21.2	6.76	2.85	8.9	58	E.	8.9	W.	15,215		
Feb.	30.066	30.038	30.097	30.067	30.730	16.29.157	28	1.573	34.7	38.2	34.5	35.8	62.5	6	6.0	20.5	41.7	29.0	4.32	9.7	23	62	NW.	30	E.	10,893			
Mar.	30.028	29.965	30.012	30.002	30.443	16.29.459	26	1.934	34.9	41.7	37.3	38.0	83.6	12	6.9	1.58	7.4	0	4.32	1.10	19	20	61	NW.	30	NW.	13,014		
Apr.	29.853	29.788	29.847	29.829	30.164	22.29.102	21	1.062	41.3	52.2	45.1	47.2	67.0	30	34.0	3	23.0	44.0	41.2	3.15	1.94	2.3	57	NW.	4	NW.	12,155		
May	29.946	29.900	29.947	29.931	30.299	31.29.563	11	1.736	55.6	64.6	58.4	58.9	80.0	22	45.0	29	30	68.0	5.27	1.69	6.7	64	E.	25	S.	11,246			
June	30.083	30.031	30.061	30.065	30.5.3	15.29.734	9	1.789	65.0	73.8	68.5	68.4	91.2	21	61.3	1	38.9	75.7	81.4	4.52	3.62	25	50	E.	26	S.	9,881		
July	29.865	29.814	29.839	29.839	29.996	28.29.563	13	1.435	67.6	75.9	69.5	71.0	89.9	23	59.7	30	30	77.4	61.8	6.42	1.65	4.5	49	N.	23	NW.	10,498		
Aug.	30.050	30.014	30.033	30.032	30.829	25.29.665	30	1.644	69.2	75.4	70.5	71.7	91.3	20	59.0	25	32.3	78.4	67.0	5.12	1.17	22	40	NW.	30	S.	8,032		
Sept.	30.114	30.055	30.086	30.085	30.475	14.29.726	17	1.749	66.0	77.1	68.2	70.4	94.1	7	51.7	14	42.4	79.7	63.6	0.03	.02	30	39	NW.	13	SW.	9,740		
Oct.	30.153	30.083	30.125	30.120	30.570	29.29.707	8	1.863	53.7	62.4	55.6	57.2	81.1	1	35.1	26	46.0	65.5	49.9	4.21	1.61	30	31	NW.	18	NW.	12,831		
Nov.	30.084	30.041	30.055	30.040	30.452	31.29.464	28	1.968	41.4	48.2	43.6	44.5	62.4	23	22.1	25	40.3	51.8	37.8	2.57	1.28	28	64	NW.	24	N.	12,783		
Dec.	30.178	30.125	30.137	30.147	30.671	27.29.535	6	1.136	33.9	38.3	36.2	36.1	61.3	31	0.8	20	60.5	43.0	29.9	1.76	21	60	N.	19	N., E.	13,661			
Sums	290.562	289.983	290.352	290.292				11.645	591	877.9	611.2	628.9					520.8	712.2	550.0	53.78							139,149		
Means	30.047	29.997	30.028	30.024	30.832	27.29.102	12	1.970	44.5	50.6	46.2	63.2	94.1	17	0.8	20	43.4	56.4	45.8										
* January.														† September.						‡ December.									

SANDY HOOK, N. J.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Washington time.				Cloudiness (in tenths).				Clear.	Fair.	Cloudy.	On which more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond to 7.12 a. m., 3.12 p. m., and 11.12 p. m. local time. Correction for instrumental error of barometer used: From 7.12 a. m., January 1, to 11.12 p. m., December 31, 1884, inclusive, +.012 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.036; February, 0.030; March, 0.030; April, 0.030; May, 0.030; June, 0.030; July, 0.030; August, 0.030; September, 0.030; October, 0.030; November, 0.030; December, 0.030.

REMARKS.—February 22, last frost; March 6, last snow; August 10, 2.05 p. m., decided earthquake shock; October 18, first frost; October 24, first killing frost; December 18, first snow.

J. MCN. WRIGHT,  
Private, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

SANFORD, FLA.

Location of office on December 31, 1884, De Forest building.

[Latitude, 28° 49' N.; longitude, 81° 23' W. Elevation of barometer above sea level, 38 feet. Elevation of exposed thermometer above ground, 22 feet. Elevation of rain-gauge above ground, 35 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
Washington time.				Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.	Date.	Miles.	Direction from—	Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
7 p. m.	3 p. m.	11 p. m.	7 a. m.						3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.											Mean maximum.	Mean minimum.	Total amount.	Large amount.	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												

\* January.

† April.

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SANFORD, FLA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time; Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).					Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
	Number of calms.								Washington time.				Percentages.					Percentages.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
									North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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Percentages.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.43 a. m., 2.43 p. m., and 10.43 p. m., local time.

Corrections for instrumental error of barometer used: From 7 a. m., January 1, to 7 a. m., May 19, inclusive, +.014 inch; from 11 a. m., May 19, to 11 p. m., December 31, 1884, inclusive, +.024 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.040; February, 0.040; March, 0.040; April, 0.040; May, 0.040; June, 0.040; July, 0.040; August, 0.040; September, 0.040; October, 0.040; November, 0.040; December, 0.040.

REMARKS.—A small water-spout occurred over Lake Monroe on July 20; a gale of 64 miles per hour, north, occurred on October 15; the last frost of the season occurred on January 22; the first frost of the season occurred on December 3.

The office was moved from the Sanford House to the De Forest building between 11 p. m., July 31, and 7 a. m., August 1, 1884, changing the elevation of barometers 14 feet lower, thermometers 15.1 feet lower, and rain-gauge 6.6 feet lower.

J. H. MELTON  
Corporal, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

SAN FRANCISCO, CAL.

Location of office on December 31, 1884, Merchants' Exchange building, No. 431 California street.

[Latitude, 37° 49' N.; longitude, 122° 26' W. Elevation of barometer above sea-level, 60 feet. Elevation of exposed thermometer above ground, 45 feet. Elevation of rain-gauge above ground, 60 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.				Wind.				Total movement.	
	Washington time.				Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometer.			Total amount.	Any 8 consecutive 8-hourly measurements.	Date.	Miles.	Direction.	From—	Date.	Prevailing direction.		
	7 A. M.	3 P. M.	11 P. M.	11 P. M.							7 A. M.	3 P. M.	11 P. M.	Maximum.	Date.	Minimum.										
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.																In.
Jan.	30.080	30.080	30.080	30.077	30.477	1	23.541	28	30.936	47.6	61.5	50.8	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
Feb.	30.048	30.048	30.048	30.043	30.350	22	23.374	15	30.976	47.0	62.7	50.4	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
Mar.	30.078	30.078	30.078	30.073	30.350	11	23.460	9	30.764	51.6	65.5	53.8	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0
Apr.	30.024	30.024	30.024	30.021	30.350	1	23.514	10	30.657	51.9	65.5	53.8	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0
May	30.019	30.019	30.019	30.016	30.350	2	23.760	18	30.809	54.9	63.2	57.0	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2
June	30.010	30.010	30.010	30.007	30.350	14	23.707	12	30.899	55.9	63.2	58.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0
July	30.002	30.002	30.002	30.001	30.350	15	23.772	10	30.899	55.9	63.2	58.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0
Aug.	30.002	30.002	30.002	30.001	30.350	15	23.772	10	30.899	55.9	63.2	58.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0
Sept.	30.000	30.000	30.000	30.000	30.350	15	23.772	10	30.899	55.9	63.2	58.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0
Oct.	30.004	30.004	30.004	30.004	30.350	21	23.780	1	30.412	53.7	60.6	56.4	56.9	56.9	56.9	56.9	56.9	56.9	56.9	56.9	56.9	56.9	56.9	56.9	56.9	56.9
Nov.	30.013	30.013	30.013	30.013	30.350	24	23.740	20	30.479	53.6	59.2	56.6	56.5	56.5	56.5	56.5	56.5	56.5	56.5	56.5	56.5	56.5	56.5	56.5	56.5	56.5
Dec.	30.004	30.004	30.004	30.004	30.350	31	23.438	25	30.787	50.5	64.3	52.8	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5
Sums.	350.190	350.490	350.350	350.350	350.350	.....	.....	.....	6.777	632.2	712.1	663.0	669.1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Means.	29.532	29.532	29.532	29.532	29.532	.....	.....	.....	6.777	632.2	712.1	663.0	669.1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

\* One 7 a. m. observation missed.

† January.

‡ February.

§ July.

|| Inappreciable.

## SAN FRANCISCO, CAL.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—								Dew-point.			Relative humidity (per cent.).		Cloudiness (in tenths).					Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.			Mean.			7 a. m.			3 p. m.			11 p. m.			Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 3.58 a. m., 11.58 p. m., and 7.58 a. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, + .039.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, .070; February, .070; March, .070; April, .070; May, .070; June, .070; July, .070; August, .070; September, .070; October, .070; November, .070; December, .070.

REMARKS.—January, rainbows 3d and 27th; first killing frost of season, 11th; hail 27th; ice 15th and 17th; lightning 26th. February, hail 5th; sleet 6th; snow 6th and 7th. March, earthquake shocks 25th; hail 25th, 26th, 27th, and 28th; thunder-storm 25th; last frost 9th. April, lightning 24th; heavy rain-storm 11th. May, thunder-storm 17th; lightning 18th. June, large monthly rainfall, exceeding any previous record for June by over 1.50 inches. July, earthquake shock 15th. September, lightning 4th, 12th, 13th, and 14th. October, first light frost 2d; mirage 8th; lightning 12th and 16th. December, first killing frost 12th; severe norther 6th and 7th; thunder-storm 23d; lightning 24th; ice 12th, 13th, 29th, and 30th; heavy rain-storms 20th and 23d.

NELSON GOROM,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

SANTA FE, N. MEX.\*

Location of office on December 31, 1884, No. 48 San Francisco Street.

[Latitude, 35° 41' N.; longitude, 108° 57' W. Elevation of barometer above sea-level, 7,028 feet. Elevation of exposed thermometer above ground, 34 feet. Elevation of rain-gauge above ground, 30 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only.)							Temperature.								Precipitation.		Wind.			Total movement.			
	Washington time.			Monthly mean.	Highest.	Lowest.	Range.	Washington time.				Self-registering thermometers.				Total amount.	Largest amount.	Any 3 consecutive hourly measurements.	Miles.	Direction from —		Date.	Maximum hourly velocity during month.	Prevailing direction.
	7 a.m.	3 p.m.	11 p.m.					7 a.m.	3 p.m.	11 p.m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.									
1884.	In.	In.	In.	In.	In.	In.	In.	o	o	o	o	o	o	o	o	in.	in.	o	o	o	o	o	Miles.	
Jan.....	22.153	23.138	23.168	23.153	23.506	1 22.800	27 .706	25.9	38.2	38.7	30.9	54.5	2 -2 31	56.5	41.6	21.4	1.77	.56	20 30 27	N. {NE. } 4.497 {SW. }				
Feb.....																								
Mar.....																								
Apr.....																								
May.....																								
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July.....																								
Aug.....																								
Sept.....																								
Oct.....																								
Nov.....																								
Dec.....	22.153	23.138	23.168	23.153	23.506	1 22.800	27 .706	25.9	38.2	38.7	30.9	54.5	2 -2 31	56.5	41.6	21.4	1.77	.56	20 30 27	N. {NE. } 4.497 {SW. }				
Sums.....																								
Means.....																								

\* Office re-established December 1, 1884.

## SANTA FE, N. MEX.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.		Dew-point.	Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Washington time.								Clear.	Fair.	Cloudy.	On which, of inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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NOTE.—7 a. m., 8 p. m., and 11 p. m. Washington time, correspond to 5.04 a. m., 1.04 p. m., and 9.04 p. m. local time.  
Correction for instrumental error of barometer used: From 5.04 a. m., December 1, to 9.04 p. m. December 31, 1881, inclusive, +.006 inch.  
The barometric observations may be reduced to sea-level by adding the following constant for December, 6.930.

T. J. KENAN,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

SAVANNAH, GA.

Location of office on December 31, 1884, corner Bay and Drayton streets.

[Latitude, 32° 5' N.; longitude, 81° 5' W. Elevation of barometer above sea-level, 87 feet. Elevation of exposed thermometer above ground, 40 feet. Elevation of rain-gauge above ground, 50 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.			Wind.			Total movement																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
	Washington time.					Monthly mean.					Washington time.					Self-registering thermometer.					Any 3 consecutive hourly measurements.		Total amount.	Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	Washington time.			Range.	Date.	Lowest.	Date.	Highest.	Date.	Lowest.	Date.	Highest.	Date.	Lowest.	Date.	Highest.	Date.	Lowest.	Date.	Mean maximum.	Mean minimum.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	7 p. m.	3 p. m.	11 p. m.																			7 a. m.		3 p. m.	11 p. m.			Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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! One 11 p. m. observation missed.      \* Three 11 p. m. observations missed.      \* Two 7 a. m., three 3 p. m., and three 11 p. m. observations missed.      \* July.

\* For 362 days.

\* For 362 days.

\* For 362 days.

## SAVANNAH, GA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m.; Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).					Number of days—											
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.			Washington time.					Clear.	Part.	Cloudy.	On which 0.1 inch or more precipitation fell.	Maximum below 33°.	Minimum below 33°.	Maximum above 90°.	Thunder-storms.	Aurora.				
									7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.										7 a. m.	3 p. m.	11 p. m.	Mean.
1884.																													
Jan.....	9	9	4	5	8	14	13	17	34.0	35.5	36.2	35.2	74.8	54.8	71.0	69.9	2	8	10	12	12	0	0	1	0				
Feb.....	9	9	4	6	10	29	5	13	46.3	47.9	48.8	47.7	80.3	55.7	75.2	70.4	2	13	15	11	11	0	0	1	0				
Mar.....	7	7	1	13	9	28	14	11	48.7	48.3	50.6	49.2	76.4	53.8	71.6	66.9	4	12	11	11	11	0	0	0	0				
Apr.....	8	8	2	5	9	10	16	22	49.5	47.1	52.1	49.6	70.0	45.7	67.4	61.0	4	15	12	12	12	0	0	0	0				
May.....	8	9	8	17	22	10	15	8	63.8	60.1	64.6	62.8	76.1	47.1	75.7	68.2	2	14	14	12	12	0	0	0	0				
June.....	9	9	13	20	24	10	15	1	67.5	66.1	67.8	67.1	84.2	57.3	82.5	76.7	5	14	14	12	12	0	0	0	0				
July.....	9	9	2	8	7	20	9	5	72.9	70.0	72.6	71.6	79.5	57.9	78.2	71.6	7	17	17	17	17	0	0	0	0				
Aug.....	16	11	13	16	8	9	5	4	71.3	70.0	71.7	71.2	67.4	64.5	68.4	70.1	9	17	16	16	16	0	0	0	0				
Sept.....	20	11	23	10	6	3	7	3	68.4	66.9	68.9	68.4	68.1	62.0	64.6	78.2	16	14	13	12	12	0	0	0	0				
Oct.....	18	23	21	11	4	4	7	4	60.0	59.7	62.2	60.6	68.3	55.3	70.9	73.1	21	8	7	8	8	0	0	0	0				
Nov.....	25	8	7	7	9	4	13	16	43.1	44.8	44.0	44.0	73.7	47.5	73.2	66.4	21	11	9	12	12	0	0	0	0				
Dec.....	20	12	12	4	15	6	4	13	44.0	40.7	46.6	43.8	81.7	62.5	78.5	74.6	10	9	12	12	12	0	0	0	0				
Sums ..	152	96	134	123	187	116	139	120	670.8	663.7	691.0	675.2	961.2	663.4	923.9	861.2	143	142	60	130	0	12	21	28	0				
Means .	Percentages.																												
	14.0	8.9	12.4	11.4	17.3	10.7	12.8	11.1	55.9	53.3	57.6	56.8	80.1	55.7	77.0	70.9	4.2	40.4	40.1	35.5	0	2.2	5.9	10.7	0				

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.44 a. m., 2.44 p. m., and 10.44 p. m., local time.

Correction for instrumental error of barometer used: From 6.44 a. m., January 1, to 10.44 p. m., December 31, 1884, inclusive, —.009 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.100; February, 0.000; March, 0.000; April, 0.090; May, 0.090; June, 0.090; July, 0.090; August, 0.090; September, 0.090; October, 0.090; November, 0.090; December, 0.100.

REMARKS.—Light frost April 10, last of spring; light frost October 25, first of season; heavy frost December 3, first of season.

S. C. EMBERY,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884 - Continued.*

SHAW, FORT, MONT.

Location of office on December 31, 1884, post quarters.

[Latitude, 47° 31' N.; longitude, 111° 48' W. Elevation of barometer above sea-level, 3,550 (B) feet. Elevation of exposed thermometer above ground, 7 feet. Elevation of rain-gauge above ground, 24 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.			Total movement.				
	Washington time.			Monthly mean.			Washington time.			Self-registering thermometers.			Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.									
	7 a. m.	3 p. m.	11 p. m.	In.	W.	In.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Latest amount.	Date.		Miles.	Direction.	Date.	
1884.																										
Jan.	26.423	26.411	26.409	26.414	26.402	1.25.991	26.808	19.6	23.8	20.4	21.9	51.0	12	-15.0	4	68.0	30.1	11.5	.86	38	3	49	SW.	12.31	SW.	
Feb.	26.362	26.355	26.376	26.364	26.356	26.25.651	1.202	6.1	13.5	8.8	9.5	53.0	24	-32.5	11	85.0	19.0	-0.1	.82	26	19	20	44	SW.	1	SW.
Mar.	26.284	26.271	26.277	26.277	26.265	1.20.25.801	1.069	20.7	36.1	27.1	28.0	55.3	24	-22.5	7	77.8	39.8	18.5	.42	12	7	31	SW.	25	SW.	
Apr.	26.360	26.352	26.364	26.364	26.348	18.23.951	1.797	31.6	49.1	40.5	40.4	70.8	21	20.8	19	50.0	53.4	30.4	.59	22	7	27	30	NW.	9.11	W.
May	26.406	26.371	26.374	26.384	26.686	29.26.046	3.640	41.6	63.7	53.4	52.9	81.0	8	26.8	4	54.2	67.9	39.6	.74	24	27	28	30	NW.	24	W.
June	26.367	26.339	26.333	26.344	26.651	30.26.171	2.440	53.8	71.4	62.3	63.0	91.5	19	45.0	1	46.5	78.6	51.5	.97	25	5	56	35	NW.	31	W.
July	26.411	26.376	26.383	26.393	26.512	30.26.131	3.1	49.8	52.0	71.4	61.4	85.0	5	37.8	5	47.2	73.5	50.4	2.08	96	21	22	44	NW.	31	W.
Aug.	26.459	26.432	26.429	26.451	26.653	2.56.197	3.458	52.0	70.3	63.6	64.0	92.0	10	36.5	20	55.5	70.4	49.3	.59	49	14	42	NW.	1	W.	
Sept.	26.316	26.304	26.310	26.303	26.592	19.26.014	2.7	58.5	40.1	57.3	46.8	80.0	20	21.0	30	59.0	60.2	38.0	2.29	16	14	23	NW.	27	W.	
Oct.	26.328	26.317	26.310	26.318	26.713	16.25.959	1.744	38.7	55.9	44.3	48.3	78.0	17	21.5	20	56.5	53.1	34.9	.39	25	2	45	NW.	25	W.	
Nov.	26.416	26.414	26.427	26.430	26.656	15.26.153	24.503	32.3	47.6	37.3	39.1	67.0	7	-3.5	22	70.5	50.5	27.0	.84	42	16	47	SW.	26	W.	
Dec.	26.350	26.344	26.352	26.349	26.827	9.25.912	26.915	-1.0	7.9	1.7	2.9	62.2	1	-44.5	24	106.7	11.1	-6.1	2.47	46	6	40	SW.	3	W.	
Sum.	316.534	316.250	316.360	316.360	316.390	8.232	387.5	577.4	467.6	477.7	477.7	592.0	110	-44.5	924	774.9	632.6	344.9	13.64	.....	.....	.....	.....	.....	W.	
Means.	26.378	26.355	26.365	26.366	26.856	126.25.654	1.17	686	32.3	48.1	39.0	59.8	22.0	-44.5	924	64.6	51.9	28.7	.....	.....	.....	.....	.....	.....	.....	

\* Mean of 24 days.

† February.

‡ August.

§ December.



## SHAW, FORT, MONT.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—								Dew-point.	Relative humidity (per cent.).	Cloudiness (in tenths).					Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.			North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calm.	Washington time.					Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 82°.	Minimum below 82°.	Maximum above 90°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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Note.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.41 a. m., 12.41 p. m., and 8.41 p. m., local time. Corrections for instrumental error of barometer used: From 7 a. m., January 1, to 3 p. m., August 19, inclusive, + .080 inch; from 7 a. m., August 20, to 11 p. m., December 31, 1884, inclusive, + .017 inch.

This barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 3.860; February, 3.860; March, 3.800; April, 3.670; May, 3.600; June, 3.570; July, 3.510; August, 3.580; September, 3.610; October, 3.700; November, 3.620; December, 3.680.

SAM'L W. MORRISON  
Private, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

SHREVEPORT, LA.

Location of office on December 31, 1884, Rendall Block, No. 23 Milam street.

[Latitude, 32° 30' N.; longitude, 93° 40' W. Elevation of barometer above sea-level, 227 feet. Elevation of exposed thermometer above ground, 33 feet. Elevation of rain-gauge above ground, 44 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.					Precipitation.		Wind.			Total movement.						
Month.	Washington time.			Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Total amount.	Any 3 consecutive 8-hourly measurements.	Date.	Miles.	Maximum hourly velocity during month.		Prevailing direction.					
	7 p. m.	3 p. m.	11 p. m.						Date.	7 p. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.					Minimum.			Date.	Absolute range.	Mean maximum.	Mean minimum.	Direction from—
1884.	<i>I<sub>a</sub></i>	<i>I<sub>b</sub></i>	<i>I<sub>c</sub></i>	<i>I<sub>d</sub></i>	<i>I<sub>e</sub></i>	<i>I<sub>f</sub></i>	<i>I<sub>g</sub></i>	<i>I<sub>h</sub></i>	<i>I<sub>i</sub></i>	<i>I<sub>j</sub></i>	<i>I<sub>k</sub></i>	<i>I<sub>l</sub></i>	<i>I<sub>m</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>o</sub></i>	<i>I<sub>p</sub></i>	<i>I<sub>q</sub></i>	<i>I<sub>r</sub></i>	<i>I<sub>s</sub></i>	<i>I<sub>t</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>v</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>x</sub></i>	<i>I<sub>y</sub></i>	<i>I<sub>z</sub></i>
Jan.	30.089	30.032	30.069	30.063	30.471	29.597	14	864	32.2	45.0	39.5	38.9	75.0	31.10	5	8	64.5	48.5	30.3	14	26	NW.	1	S.	4,770	
Feb.	29.855	29.810	29.806	29.850	30.271	29.449	19	822	40.1	59.4	42.5	43.7	74.2	21.32	14	14	59.1	61.0	44.4	17	31	NW.	19	S.	5,082	
Mar.	29.806	29.772	29.784	29.787	30.220	29.498	27	777	52.5	66.3	59.7	59.8	82.0	23.32	2	48.8	70.4	53.8	47.8	17	26	NW.	11	S.	5,156	
Apr.	29.775	29.735	29.734	29.741	30.033	29.386	14	647	52.5	66.3	60.5	62.4	86.3	23.40	8	74.6	74.6	63.0	60.2	21	22	SE.	25	S.	4,848	
May.	29.761	29.747	29.745	29.751	29.977	29.567	5	360	65.6	78.8	70.5	71.9	90.6	10.55	7	34.9	82.3	70.3	42.7	21	32	SE.	25	S.	4,502	
June.	29.794	29.738	29.761	29.770	29.898	29.615	24	323	72.6	87.9	77.7	78.2	99.0	22.65	11	36.0	91.6	80.7	42.1	23	33	SE.	18	S.	2,943	
July.	29.759	29.726	29.716	29.733	29.873	29.569	9	285	78.6	95.0	85.1	86.3	104.0	9.11	12	32.5	98.8	77.0	1.94	4	32	W.	1	N.	3,348	
Aug.	29.827	29.789	29.798	29.805	29.970	29.593	29	377	72.9	90.3	79.3	80.8	103.5	29.63	5	40.0	93.7	71.9	1.94	1	23	W.	1	N.	3,251	
Sept.	29.806	29.758	29.786	29.783	30.000	29.586	23	464	72.7	88.8	79.1	80.2	97.3	6.62	2	35.3	91.9	71.1	2.10	1	19	SE.	1	S.	2,296	
Oct.	29.913	29.869	29.903	29.896	30.181	29.637	26	544	60.7	77.3	68.0	68.0	92.7	6.42	5	50.2	79.5	60.1	54	28	25	NW.	8	N.	2,086	
Nov.	29.933	29.891	29.931	29.926	30.324	29.404	22	920	44.6	63.6	53.1	53.1	76.2	3.94	8	24	45.4	63.2	43.0	23	21	NW.	30	S.	2,890	
Dec.	29.844	29.869	29.845	29.831	30.286	29.419	21	817	62.1	51.6	46.3	46.3	74.4	4.16	6	19	54.8	57.2	45.5	28	26	SE.	30	S.	5,907	
Sums	398,159	337,711	357,938	357,935	365,857	365,857	114	7,145	700.2	872.5	770.1	780.9	1,044.0	39.10	5	547.5	912.4	672.9	60.06	.....	.....	.....	.....	.....	46,509	
Means	29.847	29.809	29.828	29.828	29.828	29.828	114	565	58.4	72.7	64.2	65.1	104.0	39.10	5	45.6	78.4	64.1	.....	.....	.....	.....	.....	.....	.....	

\* January.

† April.

‡ July.

## SHREVEPORT, LA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—								Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—						River.									
	Number of calms.								Washington time.				Washington time.				Washington time.				Washington time.															
									North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.			Cloudy.	On which .01 inch or more precipitation fell.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.			
1894.	15	10	6	10	21	5	5	19	2	23.5	30.7	23.9	28.7	75.9	58.8	69.4	68.0	8	13	10	9	3	17	0	0	13	5	1	10	2	31	8	3	11	2.7	
Jan....	12	5	6	12	27	4	6	13	2	42.8	41.8	41.6	42.1	72.5	67.0	69.1	68.5	8	10	11	9	0	5	0	0	32	7	27	9	3	6	23	4	20	3.5	
Feb....	11	7	20	13	8	7	13	2	44.8	44.9	40.0	45.1	74.5	51.3	63.5	63.1	10	10	11	10 <th>0<th>0<th>0<th>0<th>0</th><th>31<th>11<th>1<th>18<th>0<th>31<th>13</th><th>11<th>24</th><th>2.7</th></th></th></th></th></th></th></th></th></th></th></th>	0 <th>0<th>0<th>0<th>0</th><th>31<th>11<th>1<th>18<th>0<th>31<th>13</th><th>11<th>24</th><th>2.7</th></th></th></th></th></th></th></th></th></th></th>	0 <th>0<th>0<th>0</th><th>31<th>11<th>1<th>18<th>0<th>31<th>13</th><th>11<th>24</th><th>2.7</th></th></th></th></th></th></th></th></th></th>	0 <th>0<th>0</th><th>31<th>11<th>1<th>18<th>0<th>31<th>13</th><th>11<th>24</th><th>2.7</th></th></th></th></th></th></th></th></th>	0 <th>0</th> <th>31<th>11<th>1<th>18<th>0<th>31<th>13</th><th>11<th>24</th><th>2.7</th></th></th></th></th></th></th></th>	0	31 <th>11<th>1<th>18<th>0<th>31<th>13</th><th>11<th>24</th><th>2.7</th></th></th></th></th></th></th>	11 <th>1<th>18<th>0<th>31<th>13</th><th>11<th>24</th><th>2.7</th></th></th></th></th></th>	1 <th>18<th>0<th>31<th>13</th><th>11<th>24</th><th>2.7</th></th></th></th></th>	18 <th>0<th>31<th>13</th><th>11<th>24</th><th>2.7</th></th></th></th>	0 <th>31<th>13</th><th>11<th>24</th><th>2.7</th></th></th>	31 <th>13</th> <th>11<th>24</th><th>2.7</th></th>	13	11 <th>24</th> <th>2.7</th>	24	2.7	
Mar....	7	6	9	16	19	4	6	14	9	50.1	49.8	51.2	50.4	80.5	64.0	68.8	67.8	8	14	8	14	0 <th>0<th>0<th>0<th>20<th>6</th><th>30<th>16</th><th>7</th><th>13</th><th>3</th><th>11</th><th>7</th><th>11.9</th></th></th></th></th></th>	0 <th>0<th>0<th>20<th>6</th><th>30<th>16</th><th>7</th><th>13</th><th>3</th><th>11</th><th>7</th><th>11.9</th></th></th></th></th>	0 <th>0<th>20<th>6</th><th>30<th>16</th><th>7</th><th>13</th><th>3</th><th>11</th><th>7</th><th>11.9</th></th></th></th>	0 <th>20<th>6</th><th>30<th>16</th><th>7</th><th>13</th><th>3</th><th>11</th><th>7</th><th>11.9</th></th></th>	20 <th>6</th> <th>30<th>16</th><th>7</th><th>13</th><th>3</th><th>11</th><th>7</th><th>11.9</th></th>	6	30 <th>16</th> <th>7</th> <th>13</th> <th>3</th> <th>11</th> <th>7</th> <th>11.9</th>	16	7	13	3	11	7	11.9	
Apr....	10	12	14	13	16	9	4	9	6	62.8	64.3	64.8	63.8	88.5	65.0	83.1	78.9	7	15	9	12 <th>0<th>0<th>2</th><th>3</th><th>32</th><th>8</th><th>14<th>21<th>1</th><th>11</th><th>7</th><th>29</th><th>2.7</th></th></th></th></th>	0 <th>0<th>2</th><th>3</th><th>32</th><th>8</th><th>14<th>21<th>1</th><th>11</th><th>7</th><th>29</th><th>2.7</th></th></th></th>	0 <th>2</th> <th>3</th> <th>32</th> <th>8</th> <th>14<th>21<th>1</th><th>11</th><th>7</th><th>29</th><th>2.7</th></th></th>	2	3	32	8	14 <th>21<th>1</th><th>11</th><th>7</th><th>29</th><th>2.7</th></th>	21 <th>1</th> <th>11</th> <th>7</th> <th>29</th> <th>2.7</th>	1	11	7	29	2.7		
May....	6	7	15	13	18	4	5	9	13	68.6	69.8	70.8	69.7	87.6	57.0	80.0	74.9	10	16	4	11 <th>0<th>0<th>23</th><th>3</th><th>28</th><th>3<th>4</th><th>18</th><th>7</th><th>30</th><th>9</th><th>8</th><th>24</th><th>2.6</th></th></th></th>	0 <th>0<th>23</th><th>3</th><th>28</th><th>3<th>4</th><th>18</th><th>7</th><th>30</th><th>9</th><th>8</th><th>24</th><th>2.6</th></th></th>	0 <th>23</th> <th>3</th> <th>28</th> <th>3<th>4</th><th>18</th><th>7</th><th>30</th><th>9</th><th>8</th><th>24</th><th>2.6</th></th>	23	3	28	3 <th>4</th> <th>18</th> <th>7</th> <th>30</th> <th>9</th> <th>8</th> <th>24</th> <th>2.6</th>	4	18	7	30	9	8	24	2.6	
June....	5	1	12	9	23	21	11	4	7	73.1	71.2	74.3	72.9	83.6	47.0	70.6	67.1	12	17	2 <th>4<th>0<th>0<th>31<th>0<th>18<th>2<th>1<th>7<th>0<th>31<th>11<th>2</th><th>12</th><th>6.3</th></th></th></th></th></th></th></th></th></th></th></th></th>	4 <th>0<th>0<th>31<th>0<th>18<th>2<th>1<th>7<th>0<th>31<th>11<th>2</th><th>12</th><th>6.3</th></th></th></th></th></th></th></th></th></th></th></th>	0 <th>0<th>31<th>0<th>18<th>2<th>1<th>7<th>0<th>31<th>11<th>2</th><th>12</th><th>6.3</th></th></th></th></th></th></th></th></th></th></th>	0 <th>31<th>0<th>18<th>2<th>1<th>7<th>0<th>31<th>11<th>2</th><th>12</th><th>6.3</th></th></th></th></th></th></th></th></th></th>	31 <th>0<th>18<th>2<th>1<th>7<th>0<th>31<th>11<th>2</th><th>12</th><th>6.3</th></th></th></th></th></th></th></th></th>	0 <th>18<th>2<th>1<th>7<th>0<th>31<th>11<th>2</th><th>12</th><th>6.3</th></th></th></th></th></th></th></th>	18 <th>2<th>1<th>7<th>0<th>31<th>11<th>2</th><th>12</th><th>6.3</th></th></th></th></th></th></th>	2 <th>1<th>7<th>0<th>31<th>11<th>2</th><th>12</th><th>6.3</th></th></th></th></th></th>	1 <th>7<th>0<th>31<th>11<th>2</th><th>12</th><th>6.3</th></th></th></th></th>	7 <th>0<th>31<th>11<th>2</th><th>12</th><th>6.3</th></th></th></th>	0 <th>31<th>11<th>2</th><th>12</th><th>6.3</th></th></th>	31 <th>11<th>2</th><th>12</th><th>6.3</th></th>	11 <th>2</th> <th>12</th> <th>6.3</th>	2	12	6.3	
July....	21	13	16	19	14	5	2	1	2	65.2	69.1	70.5	69.8	85.6	51.6	75.3	70.8	13	17	1 <th>4<th>0<th>0<th>22<th>0<th>1<th>5<th>1<th>0<th>2<th>24<th>1<th>7<th>0<th>4.8</th></th></th></th></th></th></th></th></th></th></th></th></th></th></th>	4 <th>0<th>0<th>22<th>0<th>1<th>5<th>1<th>0<th>2<th>24<th>1<th>7<th>0<th>4.8</th></th></th></th></th></th></th></th></th></th></th></th></th></th>	0 <th>0<th>22<th>0<th>1<th>5<th>1<th>0<th>2<th>24<th>1<th>7<th>0<th>4.8</th></th></th></th></th></th></th></th></th></th></th></th></th>	0 <th>22<th>0<th>1<th>5<th>1<th>0<th>2<th>24<th>1<th>7<th>0<th>4.8</th></th></th></th></th></th></th></th></th></th></th></th>	22 <th>0<th>1<th>5<th>1<th>0<th>2<th>24<th>1<th>7<th>0<th>4.8</th></th></th></th></th></th></th></th></th></th></th>	0 <th>1<th>5<th>1<th>0<th>2<th>24<th>1<th>7<th>0<th>4.8</th></th></th></th></th></th></th></th></th></th>	1 <th>5<th>1<th>0<th>2<th>24<th>1<th>7<th>0<th>4.8</th></th></th></th></th></th></th></th></th>	5 <th>1<th>0<th>2<th>24<th>1<th>7<th>0<th>4.8</th></th></th></th></th></th></th></th>	1 <th>0<th>2<th>24<th>1<th>7<th>0<th>4.8</th></th></th></th></th></th></th>	0 <th>2<th>24<th>1<th>7<th>0<th>4.8</th></th></th></th></th></th>	2 <th>24<th>1<th>7<th>0<th>4.8</th></th></th></th></th>	24 <th>1<th>7<th>0<th>4.8</th></th></th></th>	1 <th>7<th>0<th>4.8</th></th></th>	7 <th>0<th>4.8</th></th>	0 <th>4.8</th>	4.8	
Aug....	7	9	11	35	21	3	0	0	4	68.2	68.2	68.7	67.7	88.3	49.9	71.8	68.3	16	8	6 <th>6<th>0<th>0<th>5<th>0<th>2<th>1<th>5<th>0<th>2<th>27<th>20<th>1<th>11<th>0<th>11.4</th></th></th></th></th></th></th></th></th></th></th></th></th></th></th></th>	6 <th>0<th>0<th>5<th>0<th>2<th>1<th>5<th>0<th>2<th>27<th>20<th>1<th>11<th>0<th>11.4</th></th></th></th></th></th></th></th></th></th></th></th></th></th></th>	0 <th>0<th>5<th>0<th>2<th>1<th>5<th>0<th>2<th>27<th>20<th>1<th>11<th>0<th>11.4</th></th></th></th></th></th></th></th></th></th></th></th></th></th>	0 <th>5<th>0<th>2<th>1<th>5<th>0<th>2<th>27<th>20<th>1<th>11<th>0<th>11.4</th></th></th></th></th></th></th></th></th></th></th></th></th>	5 <th>0<th>2<th>1<th>5<th>0<th>2<th>27<th>20<th>1<th>11<th>0<th>11.4</th></th></th></th></th></th></th></th></th></th></th></th>	0 <th>2<th>1<th>5<th>0<th>2<th>27<th>20<th>1<th>11<th>0<th>11.4</th></th></th></th></th></th></th></th></th></th></th>	2 <th>1<th>5<th>0<th>2<th>27<th>20<th>1<th>11<th>0<th>11.4</th></th></th></th></th></th></th></th></th></th>	1 <th>5<th>0<th>2<th>27<th>20<th>1<th>11<th>0<th>11.4</th></th></th></th></th></th></th></th></th>	5 <th>0<th>2<th>27<th>20<th>1<th>11<th>0<th>11.4</th></th></th></th></th></th></th></th>	0 <th>2<th>27<th>20<th>1<th>11<th>0<th>11.4</th></th></th></th></th></th></th>	2 <th>27<th>20<th>1<th>11<th>0<th>11.4</th></th></th></th></th></th>	27 <th>20<th>1<th>11<th>0<th>11.4</th></th></th></th></th>	20 <th>1<th>11<th>0<th>11.4</th></th></th></th>	1 <th>11<th>0<th>11.4</th></th></th>	11 <th>0<th>11.4</th></th>	0 <th>11.4</th>	11.4
Sept....	25	7	7	23	7	1	1	1	9	57.3	56.1	58.5	57.3	80.1	50.5	77.8	72.5	18	5	8	5 <th>0<th>0<th>0<th>0<th>4</th><th>8<th>0<th>10<th>1<th>3<th>10<th>3<th>7.7</th></th></th></th></th></th></th></th></th></th></th></th>	0 <th>0<th>0<th>0<th>4</th><th>8<th>0<th>10<th>1<th>3<th>10<th>3<th>7.7</th></th></th></th></th></th></th></th></th></th></th>	0 <th>0<th>0<th>4</th><th>8<th>0<th>10<th>1<th>3<th>10<th>3<th>7.7</th></th></th></th></th></th></th></th></th></th>	0 <th>0<th>4</th><th>8<th>0<th>10<th>1<th>3<th>10<th>3<th>7.7</th></th></th></th></th></th></th></th></th>	0 <th>4</th> <th>8<th>0<th>10<th>1<th>3<th>10<th>3<th>7.7</th></th></th></th></th></th></th></th>	4	8 <th>0<th>10<th>1<th>3<th>10<th>3<th>7.7</th></th></th></th></th></th></th>	0 <th>10<th>1<th>3<th>10<th>3<th>7.7</th></th></th></th></th></th>	10 <th>1<th>3<th>10<th>3<th>7.7</th></th></th></th></th>	1 <th>3<th>10<th>3<th>7.7</th></th></th></th>	3 <th>10<th>3<th>7.7</th></th></th>	10 <th>3<th>7.7</th></th>	3 <th>7.7</th>	7.7		
Oct....	14	2	2	15	8	2	2	2	14	31	42.0	43.8	45.5	43.8	91.1	52.9	72.4	74.5	15	4	7 <th>0<th>0<th>0<th>0<th>20<th>9<th>31<th>4<th>2<th>1<th>16</th><th>7</th><th>8</th><th>7.8</th></th></th></th></th></th></th></th></th></th></th>	0 <th>0<th>0<th>0<th>20<th>9<th>31<th>4<th>2<th>1<th>16</th><th>7</th><th>8</th><th>7.8</th></th></th></th></th></th></th></th></th></th>	0 <th>0<th>0<th>20<th>9<th>31<th>4<th>2<th>1<th>16</th><th>7</th><th>8</th><th>7.8</th></th></th></th></th></th></th></th></th>	0 <th>0<th>20<th>9<th>31<th>4<th>2<th>1<th>16</th><th>7</th><th>8</th><th>7.8</th></th></th></th></th></th></th></th>	0 <th>20<th>9<th>31<th>4<th>2<th>1<th>16</th><th>7</th><th>8</th><th>7.8</th></th></th></th></th></th></th>	20 <th>9<th>31<th>4<th>2<th>1<th>16</th><th>7</th><th>8</th><th>7.8</th></th></th></th></th></th>	9 <th>31<th>4<th>2<th>1<th>16</th><th>7</th><th>8</th><th>7.8</th></th></th></th></th>	31 <th>4<th>2<th>1<th>16</th><th>7</th><th>8</th><th>7.8</th></th></th></th>	4 <th>2<th>1<th>16</th><th>7</th><th>8</th><th>7.8</th></th></th>	2 <th>1<th>16</th><th>7</th><th>8</th><th>7.8</th></th>	1 <th>16</th> <th>7</th> <th>8</th> <th>7.8</th>	16	7	8	7.8	
Nov....	13	12	3	15	13	5	4	10	18	38.0	40.1	39.6	39.2	85.6	67.9	78.3	77.3	6	8	17	12 <th>0<th>0<th>0<th>0<th>0<th>0<th>0<th>0<th>0<th>0<th>0<th>0<th>0</th><th>0</th><th>0</th></th></th></th></th></th></th></th></th></th></th></th></th>	0 <th>0<th>0<th>0<th>0<th>0<th>0<th>0<th>0<th>0<th>0<th>0<th>0</th><th>0</th><th>0</th></th></th></th></th></th></th></th></th></th></th></th>	0 <th>0<th>0<th>0<th>0<th>0<th>0<th>0<th>0<th>0<th>0<th>0</th><th>0</th><th>0</th></th></th></th></th></th></th></th></th></th></th>	0 <th>0<th>0<th>0<th>0<th>0<th>0<th>0<th>0<th>0<th>0</th><th>0</th><th>0</th></th></th></th></th></th></th></th></th></th>	0 <th>0<th>0<th>0<th>0<th>0<th>0<th>0<th>0<th>0</th><th>0</th><th>0</th></th></th></th></th></th></th></th></th>	0 <th>0<th>0<th>0<th>0<th>0<th>0<th>0<th>0</th><th>0</th><th>0</th></th></th></th></th></th></th></th>	0 <th>0<th>0<th>0<th>0<th>0<th>0<th>0</th><th>0</th><th>0</th></th></th></th></th></th></th>	0 <th>0<th>0<th>0<th>0<th>0<th>0</th><th>0</th><th>0</th></th></th></th></th></th>	0 <th>0<th>0<th>0<th>0<th>0</th><th>0</th><th>0</th></th></th></th></th>	0 <th>0<th>0<th>0<th>0</th><th>0</th><th>0</th></th></th></th>	0 <th>0<th>0<th>0</th><th>0</th><th>0</th></th></th>	0 <th>0<th>0</th><th>0</th><th>0</th></th>	0 <th>0</th> <th>0</th> <th>0</th>	0	0	0
Dec....	147	95	108	200	200	71	53	115	109	640.4	647.8	691.4	650.0	1007.9	962.9	987.1	952.7	127	148	91	103	3	32	106	14	.....	.....	.....	.....	.....	105	11	157	8.6		
Sums	Percentages.																																			
Means.	13.4	8.7	9.8	18.2	18.2	6.5	8.10	59.9	63.4	54.0	55.1	54.2	54.0	55.2	72.9	71.0	5.0	5.5	3.5	4.7	84.7	74.0	4.24	9.28	1.8	82	8	14	—	0	2	724	8	9	13	1.3

\* May.

† September.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.54 a. m., 1.54 p. m., and 9.54 p. m., local time. Corrections for instrumental error of barometer used: From 7 a. m., January 1, 1884, inclusive, + .021 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.250; February, 0.250; March, 0.250; April, 0.240; May, 0.240; June, 0.239; July, 0.239; August, 0.239; September, 0.240; October, 0.240; November, 0.250; December, 0.250.

REMARKS.—January 8, ice floating in the river; 9 lunar halo; frequent frosts. February, large lunar halo the 4th; flood, 24th to 26th, inclusive. March, thunder-storm, 22d; flood, 1st and 2d. April, violent thunder-storm 14th; rainbow 30th. May, violent thunder-storm 21st and 22d; flood, 11th to 17th, inclusive. August, zodiacal light 2d. First frost November 6; first killing frost, November 7; first ice, November 24.

W. S. DELANO,  
Private, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

SILL, FORT, IND. T.

Location of office on December 31, 1884, post quarters.

[Latitude, 24° 40' N.; longitude, 90° 30' W. Elevation of barometer above sea-level, 1,200 (B) feet. Elevation of exposed thermometer above ground, 6 feet. Elevation of rain-gauge above ground, 6 feet.]

Barometer readings (corrected for temperature and instrumental error only).														Temperature.						Precipitation.		Wind.			Total movement.				
Month.	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Self-registering thermometers.				Washington time.		Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Direction from—	Maximum hourly velocity during month.	Prevailing direction.						
	7 a. m.	3 p. m.	11 p. m.							Maximum.	Date.	Minimum.	Date.	Absolute range.	7 a. m.				3 p. m.	11 p. m.				Monthly mean.					
1884.																								Miles.					
Jan.	28.710	28.663	28.665	28.679	28.839	21	28.457	29	3.772	75.0	98.1	82.2	85.1	107.0	29	65.0	10	42.0	100.1	71.7	.23	.11	25	32	SW.	29	S.	7,618	
Feb.	28.801	28.738	28.746	28.763	28.965	4	28.566	19	4.19	69.3	90.5	76.2	78.1	102.0	9	53.0	5	44.0	98.0	64.8	1.21	.39	19,20	33	NE.	1	SE.	7,101	
Mar.	28.750	28.683	28.692	28.709	28.969	20	28.398	33	3.571	68.0	88.6	76.1	77.5	99.0	2	53.0	25	46.0	90.7	68.5	2.24	.53	23	36	S.	80	SE.	8,906	
Apr.	28.915	28.840	28.863	28.873	29.170	53	28.643	11	5.27	54.5	74.3	62.1	63.6	91.0	5.6	39.5	23	51.5	76.6	53.5	5.01	3.65	90,21	36	N.	8	S.	9,317	
May	28.913	28.867	28.888	28.886	29.290	6	28.355	23	3.874	40.1	57.8	46.8	48.2	74.5	3	35.0	23	48.5	60.8	39.0	2.61	.99	110,11	38	N.	27	S.	5,419	
June	28.837	28.769	28.820	28.809	29.226	31	28.222	4	1.104	25.9	36.9	30.1	31.0	66.0	3	2.0	26	64.0	41.1	23.6	2.71	1.97	19,16	42	N.	22	N.	7,668	
Sums																													
Means																													

\* Twenty-seven days.

## SILL, FORT, IND. T.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.								Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Washington time.								Mean.	11 p. m.	3 p. m.	7 a. m.	Mean.	11 p. m.	3 p. m.	7 a. m.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunderstorms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.34 a. m., 1.34 p. m. and 9.34 p. m., local time. Corrections for instrumental error of barometer used: From 7 a. m., July 1, to 11 p. m., July 10, inclusive, .60 inch; from 7 a. m., July 15, to 11 p. m., December 31, 1884, inclusive, —.025 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: July, 1.20; August, 1.18; September, 1.22; October, 1.26; November, 1.31; December, 1.33. Office records burned June 14.

J. H. DAVIS,  
Private, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

SITKA, ALASKA.

Location of office on December 31, 1884, Castle Building, first floor.

[Latitude 57° 9' N.; longitude, 136° 19' W. Elevation of barometer above sea-level, 63 feet. Elevation of exposed thermometer above ground, 13 feet. Elevation of rain-gauge above ground, 43 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.		Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	Washington time.					Monthly mean.					Self-registering thermometers.					Mean minimum.	Mean maximum.	Total amount.	Any secondary hourly measurements.	Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	7 p. m.	8 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.		Largest amount.	Date.	Miles.	Direction from—	Data.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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\* February.

† December.

‡ June.

## SITKA, ALASKA—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).	Cloudiness (in tenths).	Number of days—								
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Washington time.						Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.	Thunder-storms.	Aurora.
										7 a. m.	3 p. m.	11 p. m.	Mean.											
1884.																								
Jan.....	0	10	64	6	1	0	3	9	3	29.5	31.3	31.0	30.6	73.5	74.4	73.0	72.3	7.5	0	8	0	0	1	
Feb.....	0	23	39	7	0	2	1	4	10	22.3	25.7	23.8	24.3	73.9	72.8	74.5	72.3	7.2	5	21	0	0	2	
Mar.....	0	16	44	9	4	2	0	4	14	24.2	33.2	30.0	30.1	76.9	75.9	74.9	76.6	8.7	7	10	0	0	0	
Apr.....	0	16	24	8	0	11	13	10	9	29.9	34.5	34.0	33.0	68.3	61.7	66.6	65.5	7.1	19	2	0	0	0	
May.....	0	0	46	7	3	9	7	15	6	37.5	38.8	38.0	38.4	72.1	72.1	75.8	76.2	8.4	10	0	0	0	1	
June.....	0	1	23	4	1	27	17	9	9	42.3	45.6	45.8	44.4	82.9	75.0	76.8	78.1	8.0	23	0	0	0	0	
July.....	0	5	3	2	0	16	46	17	4	45.6	50.7	50.9	49.1	81.5	78.7	78.4	79.5	7.7	14	0	0	0	3	
Aug.....	0	1	21	9	0	13	24	15	10	49.0	50.9	51.6	50.5	84.9	73.7	79.8	83.8	6.9	20	0	0	0	4	
Sept.....	1	15	20	6	6	23	6	1	12	43.0	45.9	44.5	44.5	86.5	78.4	82.1	82.3	8.3	15	0	0	0	0	
Oct.....	2	16	18	20	1	6	5	14	11	35.6	36.6	35.8	35.8	80.8	77.7	77.7	77.3	8.0	23	0	0	0	0	
Nov.....	6	2	55	8	1	3	0	8	12	37.0	38.0	37.3	37.4	81.4	80.1	81.4	81.0	8.2	23	0	0	0	4	
Dec.....	0	30	10	8	4	3	1	7	30	24.3	25.7	25.1	25.0	74.4	74.2	76.0	75.1	4.4	11	22	0	0	0	
Sums ..	9	135	366	94	21	116	122	105	130	424.2	456.9	448.4	443.1	945.5	839.8	918.8	917.3	83.6	75	212	100	13	16	
Means ..	Percentages.									85.4	88.1	87.4	87.0	78.8	74.2	79.4	76.5	7.0	6.8	31.6	20.5	57.9	51.9	0
	Percentages.									85.4	88.1	87.4	87.0	78.8	74.2	79.4	76.5	7.0	6.8	31.6	20.5	57.9	51.9	0
	Percentages.									85.4	88.1	87.4	87.0	78.8	74.2	79.4	76.5	7.0	6.8	31.6	20.5	57.9	51.9	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 3.07 a. m., 11.07 a. m., and 7.07 p. m., local time.

Correction for instrumental error of barometer used: From 3.07 a. m., January 1, to 7.07 p. m., December 31, 1884, inclusive, +.003 inch.

Barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.070; February, 0.070; March, 0.070; April, 0.070; May, 0.060; June, 0.060; July, 0.060; August, 0.060; September, 0.060; October, 0.070; November, 0.070; December, 0.070.

JOHN J. McLEAN  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

SMITHVILLE, N. C.

Location of office on December 31, 1884, Central Building, Fort Johnston.

[Latitude, 33° 53' N.; longitude, 78° 1' W. Elevation of barometer above sea-level, 34 feet. Elevation of exposed thermometer above ground, 18 feet. Elevation of rain-gauge above ground, 33 feet.]

Barometer readings (corrected for temperature and instrumental error only).																					
Month.	Washington time.			Monthly mean.			Date.	Range.	Washington time.			Self-registering thermometers.			Precipitation.		Wind.				
	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.			Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Last 8 days.	Date.	Maximum hourly velocity during month.		Prevailing direction.
																			Miles.	Direction	
1884.																					
Jan.	30.169	30.125	30.172	30.155	30.679	27.29	42.4	43.263	24.6	0	6	57.5	51.3	34.5	2.44	8	SE.	31	9	W.	
Feb.	30.084	30.039	30.095	30.078	30.500	15.29	58.2	58.692	32.5	5	29	45.5	50.3	48.0	2.88	8	SW.	19	19	SW.	
Mar.	30.038	29.898	30.042	30.029	30.494	28.578	58.6	58.6	27.7	4	47.1	62.6	49.9	2.80	13	SW.	41	19	SW.		
Apr.	29.904	29.851	29.894	29.887	29.884	12.23	64.8	64.8	29.8	3	10	69.6	51.5	2.30	21	SW.	22	22	15 N.W.		
May	29.969	29.940	29.965	29.958	30.228	8.28	71.1	71.1	25.2	6	30	80.9	64.4	2.52	7	SW.	27	27	11	SW.	
June	30.035	30.009	30.035	30.023	30.258	16.29	76.9	76.9	23.5	6	30	80.9	64.4	2.52	7	SW.	27	27	11	SW.	
July	29.929	29.948	29.922	29.915	30.123	23.23	78.2	78.2	14.6	8	22	85.6	74.0	7.32	10	SW.	41	40	29	SW.	
Aug.	30.005	29.968	30.014	30.002	30.180	20.29	78.3	78.3	14.6	8	22	85.6	74.0	7.32	10	SW.	41	40	29	SW.	
Sept.	30.094	30.070	30.101	30.088	30.251	20.29	78.3	78.3	14.6	8	22	85.6	74.0	7.32	10	SW.	41	40	29	SW.	
Oct.	30.146	30.069	30.128	30.134	30.493	20.29	78.3	78.3	14.6	8	22	85.6	74.0	7.32	10	SW.	41	40	29	SW.	
Nov.	30.102	30.034	30.089	30.082	30.340	6.72	54.2	53.71	4.32	3	24	38.9	43.7	2.31	21	SE.	27	27	27	SE.	
Dec.	30.176	30.125	30.163	30.155	30.498	27.29	48.4	48.369	8.15	9	20	64.0	64.1	1.93	97	SE.	24	24	29	N.	
Sum.	360.651	260.210	360.610	360.489	360.679	27.29	751.1	765.3	14.0	0	475.3	394.5	674.3	386.00	.....	.....	.....	.....	.....	88,759	
Means.	30.654	30.018	30.051	30.011	30.679	27.29	62.6	63.888	14.0	0	47.5	39.6	70.4	56.2	.....	.....	.....	.....	.....	SW.	

January.

April.

July.



SMITHVILLE, N. C.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.								Relative humidity (per cent.).		Cloudiness (in tenths).					Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Washington time.								Mean.	11 p. m.	3 p. m.	7 a. m.	Mean.	11 p. m.	3 p. m.	7 a. m.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunderstorms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
										7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
1884.	18	15	2	1	6	15	23	13	0	35.8	37.0	36.7	36.5	85.5	69.1	81.0	78.5	6.4	5.5	4.3	12	1	12	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.56 a. m., 2.56 p. m., and 10.56 p. m., local time. Corrections for instrumental error of barometer used: From 4.56 a. m., January 1, to 10.56 p. m., August 31, inclusive, +.022 inch. From 6.56 a. m., September 1, to 10.56 p. m., December 31, 1884, +.013.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.040; February, 0.040; March, 0.040; April, 0.040; May, 0.040; June, 0.040; July, 0.039; August, 0.040; September, 0.040; October, 0.040; November, 0.040; December, 0.040.

F. P. CHAFFEE.  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

SPOKANE FALLS, WASH.

Location of office on December 31, 1884, Brown's Block.

[Latitude, 47° 20' N.; longitude, 117° 24' W. Elevation of barometer above sea-level, 1,900 feet. Elevation of exposed thermometer above ground, 24 feet. Elevation of rain-gauge above ground, 40 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	Washington time.					Monthly mean.					Self-registering thermometer.					Any consecutive hourly measurements.					Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	Washington time.					Monthly mean.					Self-registering thermometer.					Any consecutive hourly measurements.					Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	7 p. m.	9 p. m.	11 p. m.	Date.	<i>I<sub>N</sub></i>	<i>I<sub>W</sub></i>	Lowest.	Date.	Range.	7 a. m.	9 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Abbr.	Mean maximum.	Mean minimum.	Total amount.	Last amount.	Date.	Miles.	Direction from —	Date.	Miles.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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\* Three 7 a. m., five 8 p. m., and five 11 p. m. observations missed. \* For 28 days. \* For 864 days. \* January. \* February. \* August. \* December.

**SPOKANE FALLS, WASH.—Continued.**

[illegible]

**\* For 359 days.**

NOTE—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.19 a. m., 12.19 p. m., and 8.19 p. m., local time.

Corrections for instrumental error of barometer used: From 7 a. m., November 28, inclusive, +.005 inch; from 11 p. m., November 30, to 11 p. m.,

December 31, 1884, inclusive, +.009 inch.  
The barometric observations may be reduced to sea-level by adding the following constants for the various months: January 2.14, February 2.13, March 2.12, April

The barometric observations may be reduced to sea-level by adding the following constants for the various months: **JANUARY, 2.14; FEBRUARY, 2.13; MARCH, 2.13; APRIL, 2.06; MAY, 2.05; JUNE, 2.04; JULY, 1.98; AUGUST, 2.00; SEPTEMBER, 2.04; OCTOBER, 2.08; NOVEMBER, 2.08; DECEMBER, 2.13.**

REMARKS.—Office moved November 30. First observation in new office 11 p. m., November 30. Old office destroyed by fire November 29. Elevation of instruments

from January 1 to November 28, inclusive, as follows: Barometer above mean tide-level, 1,966 feet; thermometer above ground, 32.48 feet; rain-gauge above ground, 22.68 feet; thermom-  
eter above station barometer. Unusually heavy snow-forms from December 17 to December 28.

feet. Station barometer No. 133 broken by fire November 23, and No. 1837 adopted as station barometer. Unusually heavy snow-storms from December 17 to December 23, impeding travel on railroads. No trains between here and Portland, Oreg., during that time.

**D. MOORE,**

***Sergeant, Signal Corps, U. S. A.***

*Meteorological summary for the year ending December 31, 1884—Continued.*

SPRINGFIELD, ILL.

Location of office on December 31, 1884, corner Sixth and Monroe streets.

[Latitude, 39° 49' N.; longitude, 89° 39' W. Elevation of barometer above sea-level, 644 feet. Elevation of exposed thermometer above ground, 39 feet. Elevation of rain-gauge above ground, 61 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.	Wind.		Total movement.									
	Washington time.			Monthly mean.	Washington time.			Self-registering thermometers.			Mean maximum.	Mean minimum.	Any 3 consecutive 8-hourly measurements.	Maximum hourly velocity during month.	Prevailing direction.														
	7 a. m.	3 p. m.	11 p. m.		Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.						11 p. m.	Monthly mean.	Maximum.	Date.		Minimum.	Date.	Absolute range.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	Miles.					
Jan .....	29.511	29.495	29.521	29.509	30.005	5.29.002	10	1.003	18.2	24.2	20.0	20.862.5	30	22.3	5.84.8	29.6	12.8	1.51.1	6,678				S						
Feb .....	29.330	29.327	29.335	29.317	29.765	15.28.701	19	1.974	29.6	35.2	31.4	32.153.1	2	5.6	14.49.5	41.2	24.4	4.24.1	7,403				NW.						
Mar .....	29.327	29.301	29.328	29.319	29.721	4.28.716	1	1.005	35.2	45.0	38.8	40.068.5	27	7.0	3.59.5	48.0	32.4	3.70.1	7,904				SE.						
Apr .....	29.277	29.256	29.267	29.267	29.528	20.28.720	1	1.808	47.2	57.0	51.2	51.880.0	30	32.2	8.47.8	59.8	44.0	2.49.1	7,806				NW.						
May .....	29.301	29.281	29.291	29.291	29.452	20.28.954	18	1.008	50.8	69.1	60.7	62.778.1	21	41.0	20.37.1	71.0	52.7	3.791.07	5,415				S.						
June .....	29.335	29.316	29.334	29.335	29.548	20.28.983	9	1.565	66.3	77.8	69.7	71.390.8	22	50.9	10.39.9	80.1	62.8	6.20.1	4,248				S.						
July .....	29.277	29.257	29.264	29.260	29.504	20.29.059	4	1.445	69.6	80.4	71.0	74.900.3	22	61.2	7.29.1	83.1	66.7	3.62.84	4,340				NW.						
Aug .....	29.400	29.388	29.377	29.382	29.608	9.29.078	28	1.590	65.4	79.5	70.2	71.791.1	19	20	48.9	94.2	81.6	63.7	5,032				S.						
Sept .....	29.392	29.370	29.359	29.367	29.634	13.28.970	23	1.684	64.2	78.8	68.5	70.891.1	9	50.9	21.40.2	80.7	62.8	6.56.2	5,700				S.						
Oct .....	29.501	29.472	29.469	29.474	29.799	15.29.188	7	1.611	53.9	67.1	58.1	60.788.0	2	34.9	23.51.1	69.8	51.1	2.74.3	5,097				S.						
Nov .....	29.413	29.413	29.420	29.429	29.800	6.28.856	22	1.004	39.9	49.8	42.8	44.266.9	9	12.6	24.53.8	53.6	36.2	1.30.51	5,874				NW.						
Dec .....	29.476	29.430	29.445	29.444	29.967	19.28.684	6	1.283	27.4	31.6	28.8	29.160.0	5	8.8	19.68.8	34.8	22.4	5.19.1	7,066				S.						
Sums ..	352,590	352,210	352,440	352,430	.....	.....	.....	.....	9,670	573.7	695.5	614.7	628.0	.....	603.3	735.3	532.0	43.18	.....				S.						
Means ..	29.383	29.354	29.370	29.368	30.005	*5.28.684	16	1.806	47.8	58.0	51.2	52.391.1	110	22.3	*5.50.3	61.3	44.3	.....	.....				S.						

\* January.

† December.

‡ August.

§ September.

## SPRINGFIELD, ILL.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—										Dew-point.	Relative humidity (per cent.).	Cloudiness (in tenths).	Number of days—																								
	Number of calms.																																					
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.																														
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.																														
1884.																																						
										Washington time.																												

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.10 a. m., 2.10 p. m., and 10.10 p. m., local time.

Corrections for instrumental error of barometer used: From 0.10 a. m., January 1, to 10.10 p. m., August 31, inclusive, +.018 inob; from 6.10 a. m., September 1, to 10.10 p. m., December 31, 1884, inclusive, +.008 inob.

The barometric observations may be reduced to sea level by adding the following constants for the various months: January, 0.720; February, 0.720; March, 0.720; April, 0.700; May, 0.670; June, 0.670; July, 0.660; August, 0.660; September, 0.670; October, 0.680; November, 0.720; December, 0.730.

REMARKS.—Barometer No. 440, instrumental error —.008, substituted for No. 388, instrumental error —.018, at 6.10 a. m. (local time), September 1; January 5, temperature —22.3, coldest since opening of station. Last snow, April 22; first light frost, October 10; first killing frost, October 23; first snow, November 17.

WILLIAM NORRINGTON,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

STOCKTON, FORT, TEX.

Location of office on December 31, 1884, south corner of Plaza, half a mile from Fort Stockton.

[Latitude, 29° 53' N.; longitude, 102° 13' W. Elevation of barometer above sea-level, 3,010 (B) feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	Washington time.			Monthly mean.	Washington time.			Self-registering thermometers.			Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.	Maximum hourly velocity during month.	Direction.	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	7 a. m.	3 p. m.	11 p. m.		Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.								Maximum.	Date.	Minimum.	Date.		Absolute range.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In

\* January.

† December.

‡ July.

§ January.

## STOCKTON, FORT, TEX.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—																																	
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.		3 p. m.		11 p. m.		Mean.	7 a. m.		3 p. m.		11 p. m.		Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunder-storms.	Aurora.																
										7 a. m.	3 p. m.	7 a. m.	3 p. m.	7 a. m.	3 p. m.		7 a. m.	3 p. m.	7 a. m.	3 p. m.	7 a. m.	3 p. m.																										
1884.																																																
Jan.....	13	6	1	5	13	16	9	12	7	4	29	7	27	24.1	26.4	25.7	77.9	44.3	67.3	63.2	3.5	4.7	3.1	8	14	12	4	22	0	0	0	0	0															
Feb.....	13	1	1	14	9	12	6	4	20	32.4	36.1	36.2	35.7	35.7	36.1	35.7	63.1	39.8	49.4	47.4	6.1	6.1	5.5	4	0	0	0	0	0	0	0	0	0															
Mar.....	5	0	0	25	7	10	5	13	33	34.8	36.1	36.2	35.7	35.7	36.1	35.7	63.1	39.8	49.4	47.4	4.3	4.3	4.6	10	17	0	1	2	0	0	0	0	0															
Apr.....	4	7	5	28	24	8	6	9	2	48.6	47.6	48.6	48.6	48.6	48.6	48.6	74.7	33.8	58.2	54.6	2.7	4.4	2.8	10	10	0	0	0	0	0	0	0	0															
May.....	2	3	7	47	7	4	0	0	15	59.7	62.2	61.9	61.3	61.3	61.3	61.3	72.5	42.9	61.4	61.0	2.8	4.2	2.8	12	10	0	0	0	0	0	0	0	0															
June.....	6	4	0	60	10	2	1	2	8	63.1	72.1	67.9	67.7	67.7	67.7	67.7	72.5	43.8	64.2	63.6	2.7	3.7	2.8	15	12	0	0	0	0	0	0	0	0															
July.....	1	5	3	49	16	6	3	2	3	63.2	67.5	61.1	64.9	61.1	64.9	61.1	72.5	43.8	64.2	63.6	3.8	5.3	4.3	11	13	0	0	0	0	0	0	0	0															
Aug.....	2	1	3	33	27	4	2	3	3	62.0	60.2	63.7	62.0	63.7	62.0	63.7	72.5	43.8	64.2	63.6	2.7	3.7	2.8	15	12	0	0	0	0	0	0	0	0															
Sept.....	6	2	6	42	10	7	2	3	8	52.8	55.3	54.8	54.8	54.8	54.8	54.8	72.5	43.8	64.2	63.6	3.8	4.9	4.3	11	13	0	0	0	0	0	0	0	0															
Oct.....	9	9	9	19	13	17	4	5	17	41.1	43.8	44.6	43.0	43.0	43.0	43.0	72.5	43.8	64.2	63.6	3.4	3.5	3.2	13	13	0	0	0	0	0	0	0	0															
Nov.....	6	3	4	24	4	24	11	19	18	31.6	30.1	32.8	31.5	31.5	31.5	31.5	72.5	43.8	64.2	63.6	4.5	4.9	4.6	10	15	1	11	0	0	0	0	0	0															
Dec.....	6	3	4	24	4	24	11	19	18	31.6	30.1	32.8	31.5	31.5	31.5	31.5	72.5	43.8	64.2	63.6	4.5	4.9	4.6	10	15	1	11	0	0	0	0	0	0															
Sums..	64	50	35	345	149	119	56	89	191	550.3	572.1	576.6	568.3	568.3	568.3	568.3	520.3	742.1	742.1	45.6	55.1	42.4	47.6	151	152	63	102	5	45	96	33	0	0															
																			Percentages.								Percentages.																					
																			5.8		4.6		3.231		4.12		610.8		5.1		8.1		17.4		17.2		37.9		1.4		12.3		23.7		3.70		0	

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.17 a. m., 1.17 p. m., and 9.17 p. m., local time.

Correction for instrumental error of barometer used: from 5.17 a. m., January 1, to 3.17 p. m., December 31, 1884, inclusive, — .028 inch.  
 The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 3.140; February, 3.120; March, 3.080; April, 3.030; May, 3.010; June, 2.920; July, 2.940; August, 2.940; September, 2.960; October, 3.030; November, 3.120; December, 3.140.

REMARKS.—July 1, 1884, elevation of rain-gauge changed from 5 inches to 12 inches above ground.

JNO. W. BYRAM  
Private, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

TATOOSH ISLAND, WASH.

Location of office on December 31, 1884, on island.

[Latitude, 49° 28' N.; longitude, 124° 44' W. Elevation of barometer above sea-level, 86 feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer readings* (corrected for temperature and instrumental error only).										Temperature.						Precipitation.			Wind.					
	Washington time.					Self-registering thermometers.					Mean maximum.						Any 3 consecutive 8 hourly measurements.			Maximum hourly velocity during month.					
	Range.					Mean minimum.						Total amount.			Largest amount.			Direction from —							
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	In.	Date.	Direction from —	Maximum hourly velocity during month.	Prevailing direction.
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Jan.....	29.967	29.965	29.942	29.938	29.437	29.338	26	1.099	39.9	42.2	42.4	41.5	55.7	5	32.9	1	22.8	44.6	39.4	13.32	4.06	11.48	{SW.}	E.	E.
Feb.....	29.913	29.910	29.908	29.917	30.454	29.114	17	1.840	35.3	37.1	37.4	36.0	52.1	27	20.6	10	31.5	40.4	23.7	6.04	2.34	23.56	E.	E.	E.
Mar.....	29.910	29.929	29.911	29.917	30.227	29.304	9	.923	41.3	44.4	42.7	52.0	30	25.3	6	26.7	47.9	38.8	2.41	.69	12.13	E.	E.	E.	
Apr.....	29.920	29.933	29.931	29.928	30.202	29.368	13	.834	47.2	51.3	49.0	61.2	8	40.0	13	31.2	55.0	46.0	3.31	.69	12.13	E.	E.	E.	
May.....	29.931	29.942	29.912	29.929	30.227	29.651	19	.576	48.5	53.1	51.0	50.9	63.8	18	42.7	4	21.1	57.2	47.4	4.45	1.56	6.40	S.	{SW.}	E.
June.....	29.975	29.987	29.973	29.978	30.097	29.650	21	.447	50.6	55.8	53.4	53.3	64.2	29	46.0	1	18.2	59.3	50.1	3.96	1.06	15.16	SW.	SW.	E.
July.....	29.962	29.960	29.956	29.962	30.122	29.711	13	.411	52.9	58.8	55.6	53.8	64.5	23	49.7	13	14.8	62.1	52.6	1.73	.58	2.18	S.	SW.	E.
Aug.....	29.924	29.937	29.909	29.923	30.166	29.683	26	.483	53.8	58.8	57.0	56.2	66.2	29	46.4	19	16.8	62.2	52.8	5.49	1.60	25.26	SW.	SW.	E.
Sept.....	29.870	29.877	29.875	29.874	30.156	29.614	15	.622	50.9	51.5	53.2	52.9	62.3	10	43.2	20	30.1	57.7	50.0	6.15	1.24	23.29	SW.	E.	E.
Oct.....	29.908	29.913	29.905	29.908	30.339	29.271	12	1.068	48.7	51.1	50.4	50.1	50.8	13	41.4	6	18.4	54.7	46.8	9.03	1.80	7.84	SE.	E.	E.
Nov.....	29.933	29.956	29.927	29.942	30.296	29.626	6	.290	47.8	49.0	48.5	48.4	58.0	6.11	39.5	22	18.5	53.1	45.9	6.80	1.53	1.46	{SW.}	E.	E.
Dec.....	29.921	29.908	29.918	29.916	30.381	29.082	25	1.296	35.4	38.4	38.1	36.0	52.4	3	18.8	23	33.6	40.4	32.9	12.47	2.85	20.21	64	E.	E.
Sums.....	358.755	358.836	358.667	358.752	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Means.....	29.896	29.908	29.889	29.896	30.454	29.082	23	.814	46.0	49.4	48.0	47.8	66.2	11.9	18.8	33.3	47.5	44.7	.....	.....	.....	.....	.....	.....	.....

• Wind data for December for 27½ days.

† For 362½ days.

‡ February.

§ December.

|| August.

\* Wind data for December for 27½ days.

† For 30½ days.

‡ February.

§ December.

|| August.



## TATOOSH ISLAND, WASH.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m.; Washington time: Number of times observed blowing from—								Dew point		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Washington time.				Percentages.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
										7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond to 3.49 a. m., 11.49 a. m., and 7.49 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, + .009 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.100; February, 0.100; March, 0.100; April, 0.090; May, 0.090; June, 0.090; July, 0.090; August, 0.090; September, 0.090; October, 0.090; November, 0.100; December, 0.100.

REMARKS.—Comet observed first time, January 14; first frost December 7; first snow December 13.

R. L. SEBASTIAN,  
Private, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1894—Continued.*

THOMAS, FORT, ARIZ.

Location of office on December 31, 1894, post quarters.

[Latitude, 33° 4' N.; longitude, 110° 2' W. Elevation of barometer above sea-level, 2,710 (B) feet. Elevation of exposed thermometer above ground, 8 feet. Elevation of rain-gauge above ground, 2 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.*			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	Washington time.					Monthly mean.					Washington time.					Self-registering ther- mometers.					Any 3 con- secutive 8-hourly measure- ments.		Maximum hourly velocity during month.				Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	7 p. m.		3 p. m.		11 p. m.	Lowest.		Date.		Range.		7 a. m.		3 p. m.		11 p. m.	Monthly mean.	Maximum.		Date.		Absolute range.		Mean maximum.				Mean minimum.		Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.			W.	In.							W.	In.	W.	In.	W.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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\* No anemometer used.

† January.

‡ February.

§ July.

## THOMAS, FORT, ARIZ.—Continued

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of time observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—						Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Washington time.				Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.			Maximum above 30°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.48 a. m., 12.48 p. m., and 8.48 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1 to 11 p. m., December 31, 1884, inclusive, +.014 inch.

The barometric observations may be reduced to sea level, by adding the following constants for the various months: January, 2.830; February, 2.830; March, 2.780; April, 2.730; May, 2.670; June, 2.630; July, 2.590; August, 2.600; September, 2.640; October, 2.710; November, 2.840; December, 2.820.

G. A. MARTIN,  
Private, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

TOLEDO, OHIO.

Location of office on December 31, 1884, Room 41, Finlay Block, corner Madison and Summit streets.

[Latitude, 41° 40' N.; longitude, 83° 34' W. Elevation of barometer above sea level, 651 feet. Elevation of exposed thermometer above ground, 65 feet. Elevation of rain-gauge above ground, 106 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.					Precipitation.			Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	Washington time.					Washington time.					Self-registering ther- mometers.					Any 3-con- secutive 8-hourly measure- ments.	Total amount.	Largest amount.	Date.	Miles.	Direction from—		Date.	Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Monthly mean.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.										Mean minimum.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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<sup>1</sup> One 3 p. m. observation missed.

<sup>2</sup> One 11 p. m. observation missed.

<sup>3</sup> January.

<sup>4</sup> April.

<sup>5</sup> June.

<sup>6</sup> August.

<sup>7</sup> September.

## TOLEDO, OHIO.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.			Relative humidity (per cent.).				Cloudiness (in tenths).			Number of days—								
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Washington time.				Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.	
									Number of calms.	7 a. m.	3 p. m.	11 p. m.															
1884.																											
Jan.	6	9	1	1	5	33	30	7	1	11.7	10.4	13.8	14.0	80.8	72.3	79.8	77.6	7.0	3	13	15	15	19	29	0	1	0
Feb.	2	13	6	9	13	15	14	9	2	23.2	25.3	23.2	24.6	83.6	75.3	83.5	80.8	8.5	1	8	20	16	8	25	0	0	0
Mar.	18	15	7	4	10	15	14	13	24.6	27.8	24.6	27.1	79.6	65.0	67.4	73.4	6.9	4	12	16	15	8	15	0	2	0	1
Apr.	10	18	19	4	4	3	12	14	6	35.4	33.2	34.6	37.5	72.5	53.9	67.4	64.6	6.4	7	11	12	7	0	3	0	2	0
May	4	10	7	2	9	22	18	9	12	47.5	47.9	47.9	47.8	73.7	55.9	70.4	60.7	4.9	8	16	7	15	0	0	1	14	0
June	4	10	20	4	9	4	7	3	20	60.5	69.9	60.5	60.3	77.8	59.8	76.5	63.8	4.4	11	12	7	11	0	0	1	14	0
July	4	9	7	0	4	13	32	6	17	59.0	57.4	59.5	58.3	73.0	53.5	70.4	63.8	5.0	6	17	7	11	0	0	3	1	0
Aug.	13	6	4	2	23	17	11	6	11	56.3	56.3	56.4	56.3	78.8	53.5	72.7	68.4	3.7	14	13	4	5	0	0	3	1	0
Sept.	10	5	7	6	39	17	5	3	2	45.7	46.7	47.8	46.8	81.7	59.3	73.6	72.4	3.5	4	12	4	7	0	0	3	1	0
Oct.	6	6	7	5	25	24	14	5	1	30.8	34.1	31.9	32.3	81.6	64.3	76.0	74.6	4.7	10	15	6	9	0	0	3	1	0
Nov.	2	6	3	3	11	28	13	9	1	21.8	25.7	24.3	23.9	78.4	75.3	70.7	77.8	6.1	3	9	13	2	14	0	0	0	0
Dec.	0	7	5	3	18	27	15	4	2	21.8	25.7	24.3	23.9	78.4	75.3	70.7	77.8	6.1	3	9	13	2	14	0	0	0	0
Sums ..	80	126	92	48	160	216	187	91	97	472.6	488.8	492.6	494.7	942.7	741.1	901.7	861.8	63.0	89	147	129	133	49	112	7	31	2
Means ..	Percentages.								Percentages.								Percentages.										
	7.3 11.5 8.4 4.4 14.6 19.7 17.0 8.3 8.8																5.7 21.4 40.3 35.8 36.4 13.4 30.6 1.9 8.5 0.6										

*Meteorological summary for the year ending December 31, 1884—Continued.*

TOTTEN, FORT, DAK.

Location of office on December 31, 1884, The Palmer House.

[Latitude, 47° 57' N.; longitude, 98° 57' W. Elevation of barometer above sea-level, 1,490 feet. Elevation of exposed thermometer above ground, 16 feet. Elevation of rain-gauge above ground, 5 feet]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	Washington time.					Monthly mean.					Washington time.			Self-registering thermometers.			Total amount.		Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.		Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
	7 p. m.		5 p. m.		11 p. m.	In.	In.	In.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.		Largest amount.	Date.	Miles.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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\* For 23 days only.

† For 26 days only.

TOTTEN, FORT, DAK.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—									Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).				Number of days—														
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.		
1884.	Jan.	2	5	4	17	26	4	4	0	60.5	62.5	59.2	60.7	85.5	61.5	77.2	77.7	5.5	4.5	4.8	4.8	8	9	5	11	0	0	4	7	0	0	
	Feb.	9	9	7	18	9	13	6	22	0	52.8	56.0	54.2	54.3	85.2	59.1	81.9	75.4	5.3	4.9	2.7	5.0	7	19	5	12	0	0	0	9	4	2
	Mar.	11	5	3	19	20	16	5	14	0	52.7	56.7	55.5	55.0	86.0	55.9	80.2	74.0	4.3	5.6	2.8	4.2	13	15	3	13	0	0	5	6	2	4
	Apr.	6	1	8	13	11	13	15	11	0	42.0	46.0	46.6	44.9	86.7	54.0	80.1	73.5	5.4	6.2	5.0	5.5	4	16	3	10	0	0	0	1	1	3
	May	11	1	2	20	19	8	7	24	1	30.9	33.8	34.1	32.9	83.1	55.1	77.5	71.9	4.4	4.7	4.4	4.5	11	14	6	10	0	14	0	1	0	0
	June	9	3	9	7	7	17	8	27	3	17.1	24.4	19.0	20.2	87.8	77.1	85.9	83.6	3.7	5.6	3.2	4.2	12	13	5	9	14	27	0	0	0	3
	July	6	2	2	7	5	11	13	46	1	5.2	0.6	4.7	8.5	73.3	74.6	79.4	77.4	4.5	6.6	3.6	4.9	10	13	8	13	24	31	0	0	0	0
	Aug.																															
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NOTE.—7 a. m., 3 p. m. and 11 p. m., Washington time, correspond to 5.32 a. m., 1.32 p. m. and 9.32 p. m., local time.

Correction for instrumental error of barometer used: From 5.32 a. m., June 9, to 9.32 p. m., December 31, 1884, inclusive, + 0.004 inch.

REMARKS.—Began taking meteorological observations at 5.32 a. m. June 9th. No observations taken on September 14, 15, 16, and 17. First frost September 24; killing frost September 30. First snow of the season, October 21. Navigation closed November 12.

E. J. GLASS,  
Private, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

VICKSBURG, MISS.

Location of office on December 31, 1884, Baum's building, corner of Washington and Crawford streets.

[Latitude, 32° 22' N.; longitude, 90° 53' W. Elevation of barometer above sea-level, 341 feet. Elevation of exposed thermometer above ground, 32 feet. Elevation of rain-gauge above ground, 53 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.				Wind.				Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	Washington time.					Monthly mean.					Washington time.					Self-registering thermometers.					Any 3 consecutive 8-hourly measurements.				Total amount.		Maximum hourly velocity during month.			Prevailing direction.	Miles.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	7 a. m.		3 p. m.		11 p. m.		Highest.		Date.		Lowest.		Date.		Range.		Monthly mean.		Maximum.		Minimum.		Date.		Absolute range.		Mean maximum.					Mean minimum.		Total amount.		Date.		Direction from—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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July.

April.

\* January.



**VICKSBURG, MISS.—Continued.**

Month.	Winds at 7 a. m. and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.				Relative humidity (per cent.).		Cloudiness (in tenths).				Number of days—						River.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.			11 p. m.			Mean.	Washington time.			Clear.	Fair.	Cloudy.	On which, oil lube or more precipitation fell.	Maximum below 82°.	Minimum below 32°.	Thunder-storms.	Highest.	Date.	Lowest.	Date.	Range.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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**March.**

**† December.**

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.05 a. m., 2.05 p. m., and 10.05 p. m., local time.

Correction for instrumental error of barometer used: From 6.05 a. m., January 1, to 10.05 p. m., December 31, 1884, inclusive,  $-.008$  inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.270; February, 0.260; March, 0.260; April,

0.280; May, 0.250; June, 0.250; July, 0.240; August, 0.240; September, 0.250; October, 0.200; November, 0.270; December, 0.270.

REMARKS.—During the months of February, March, April, May, and June the Mississippi River rose to a great height, causing floods that inundated the country in this area to a distance of 10 miles around the water spreading as far west as Monroe, La., with great damage to the levees on that side. The planting of crops was much retarded, while great uneasiness and apprehension was felt among the residents of the valley while the water remained above the danger line. The river fell steadily after about June 1.

**FRED. W. MIXER,**

Private, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

WASHINGTON, CITY.

Location of office on December 31, 1884, Nos. 1719 and 1721 G street northwest.

[Latitude, 38° 54' N.; longitude, 77° 2' W. Elevation of barometer above sea-level, 106 feet. Elevation of exposed thermometer above ground, 44 feet. Elevation of rain-gauge above ground 51 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.					Precipitation.			Wind.									
	Washington time.					Washington time.					Self-registering thermometers.					Any 3 consecutive 8-hourly measurements.			Maximum hourly velocity during month.		Prevailing direction.							
	Monthly mean.					Monthly mean.					Maximum.					Total amount.					Direction		Date.					
	7 p. m.	3 p. m.	11 p. m.			7 p. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	From—	Date.						
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.						
Jan.	30.089	30.022	30.001	30.061	30.760	27	29.125	8	1.635	25.4	33.4	29.5	29.452	0	8.9	1.7	6	50.3	37.2	22.6	5.59	2.21	8	24	NW.	9	S. }	
Feb.	29.991	29.964	30.014	30.890	30.608	16	29.231	28	1.377	37.9	45.6	39.1	40.970	2	13	8.2	29	61.0	49.2	32.9	6.84	1.19	23	28	NW.	28	NW. }	
Mar.	29.905	29.903	29.944	30.944	30.361	16	29.898	26	.973	37.4	48.1	41.0	42.867	0	24	13.1	1	53.9	49.8	34.9	7.24	1.77	19	29	NW.	3	NW. }	
Apr.	29.829	29.761	29.815	30.139	30.114	2	29.114	2	1.025	45.3	58.8	49.1	50.982	1	28	35.1	9	50.0	60.7	42.6	8.06	.08	9	31	NW.	8.4	NW. }	
May.	29.896	29.839	29.868	30.868	30.233	13	29.535	14	.678	56.3	73.0	60.9	64.191	8	23	42.1	29	49.7	75.2	54.6	3.09	.95	5	6	W.	23	S. }	
June.	29.699	29.951	29.964	30.971	30.388	15	29.563	26	.825	67.1	81.2	69.2	72.595	7	21	49.0	1	45.8	84.0	62.6	0.85	.03	13	14	NW.	26	S. }	
July.	29.810	29.757	29.769	30.788	30.990	22	29.547	29	.443	69.1	82.5	70.9	74.296	0	24	58.1	9	38.9	84.4	65.8	7.89	2.05	1	24	SW.	24	NW. }	
Aug.	29.860	29.934	29.939	30.958	30.209	25	29.619	30	.590	69.0	82.6	71.2	74.295	0	20	57.0	25	38.0	81.3	66.1	1.01	.34	28	29	NW.	21	N. }	
Sept.	30.052	29.984	30.021	30.410	30.636	17	29.636	17	.744	64.6	81.6	68.8	71.797	0	9	44.6	15	52.4	83.8	61.5	.14	.10	12	19	NW.	18	S. }	
Oct.	30.068	30.024	30.051	30.068	30.625	26	29.642	8	.883	53.4	68.5	56.8	59.690	2	4	81.7	30	58.5	70.4	50.4	1.73	.70	22	23	S.	22	S. }	
Nov.	30.040	29.976	29.987	30.001	30.364	3	29.379	28	.985	38.6	52.7	42.9	44.773	6	2	24.5	25	49.1	55.4	35.6	3.42	1.52	23	25	N.	29	S. }	
Dec.	30.120	30.061	30.070	30.084	30.578	27	29.461	6	1.117	31.7	40.6	35.7	36.066	6	31	6.1	19	60.5	43.3	29.7	4.70	1.47	6	30	W.	9	S. }	
Sum.	350.878	350.186	350.562	350.544																								
Means.	29.990	29.932	29.964	29.962	30.760	27	29.114	12	.940	49.9	62.3	53.9	55.097	0	19	1.7	6	50.8	64.8	46.6								S.

January.

April.

September.

## WASHINGTON, CITY—Continued.

Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—										Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
Month.		Number of calms.								7 a. m.		8 p. m.		11 p. m.		Mean.		7 a. m.		8 p. m.		11 p. m.		Mean.		Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 33°.		Minimum below 33°.		Maximum above 30°.		Thunder-storms.	Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
										North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	8 p. m.	7 a. m.	8 p. m.	7 a. m.	8 p. m.	7 a. m.	8 p. m.					7 a. m.	8 p. m.	7 a. m.	8 p. m.	7 a. m.	8 p. m.			7 a. m.	8 p. m.	7 a. m.	8 p. m.	7 a. m.	8 p. m.	7 a. m.	8 p. m.	7 a. m.	8 p. m.	7 a. m.	8 p. m.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
1884.		Jan.	18	7	9	2	22	10	23	0	21.0	33.5	73.9	73.9	6.3	8.8	6.1	5	13	13	14	8	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.002 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.120; February, 0.120; March, 0.120; April, 0.120; May, 0.110; June, 0.110; July, 0.110; August, 0.110; September, 0.110; October, 0.120; November, 0.120; December, 0.120.

T. B. HARRISON  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

WEST LAS ANIMAS, COLO.

Location of office on December 31, 1884, Saint Ange avenue, between Twelfth and Thirteenth streets.

[Latitude, 38° 4' N.; longitude, 103° 12' W. Elevation of barometer above sea-level, 3,590 feet. Elevation of exposed thermometer above ground, 22 feet. Elevation of rain-gauge above ground, 7 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.			Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
Washington time.					Washington time.					Self-registering thermometers.					Any secondary measurements.					Maximum hourly velocity during month.			Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
7 p. m.	8 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .		I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	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I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .	I <sub>a</sub> .	I <sub>u</sub> .

§ February.

§ July.

§ March.

§ January.

## WEST LAS ANIMAS, COLO.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m. Washington time: Number of times observed blowing from—								Dew-point. cent.).	Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	Number of calms.									Washington time.								Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.	Thunder-storms.	Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond to 5.15 a. m., 1.15 p. m., and 9.15 p. m., local time.

Correction for instrumental error of barometer used: From 5.15 a. m., January 1, to 9.15 p. m., December 31, 1884, inclusive, —.002 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 4.13; February, 4.13; March, 4.07; April, 3.86; May, 3.85; June, 3.77; July, 3.75; August, 3.74; September, 3.82; October, 3.93; November, 4.11; December, 4.15.

F. H. BRANDENBURG  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

WILMINGTON, N. C.

Location of office on December 31, 1884, Western Union office, in Dawson Bank building, Front street.

[Latitude, 34° 14' N.; longitude, 77° 57' W. Elevation of barometer above sea-level, 52 feet. Elevation of exposed thermometer above ground, 28 feet. Elevation of rain-gauge above ground, 44 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.				Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	Washington time.				Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.				Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.		Maximum hourly velocity during month.			Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
	7 p. m.	3 p. m.	11 p. m.	Monthly mean.							Date.	Minimum.	Date.	Absolute range.	Date.	Maximum.	Minimum.	Date.							Miles.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
					7 p. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.									Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.					Largest amount.	Date.	Miles.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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July.

April.

January.

WILMINGTON, N. C.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time; Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).					Number of days—							
	Number of calms.												Washington time.												
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunder-storms.	Aurora.
1884.																									
Jan.....	12	14	7	3	1	24	13	12	34.5	35.1	34.1	34.6	79.1	53.8	72.5	70.1	6	17	6	13	1	10	0	0	0
Feb.....	6	17	3	10	10	21	12	16	46.7	47.7	48.2	47.5	82.9	60.8	78.5	74.1	9	13	7	11	0	1	0	0	0
Mar.....	8	6	10	10	10	25	12	16	45.7	45.4	47.8	46.3	77.1	55.0	74.3	69.8	8	14	7	14	0	2	0	0	0
Apr.....	9	4	7	10	9	16	6	23	46.5	43.3	43.4	46.1	73.3	45.8	71.0	63.4	10	17	3	9	0	0	0	0	0
May.....	4	13	7	14	9	25	8	11	61.9	59.9	62.6	61.5	81.4	55.5	80.7	72.5	13	14	4	14	0	0	0	0	0
June.....	5	16	7	13	24	20	9	1	63.9	63.8	66.1	64.6	82.1	60.6	82.0	74.9	10	14	6	12	0	0	0	0	0
July.....	5	5	3	8	8	10	4	4	71.7	70.7	71.7	71.3	84.5	64.0	83.1	80.7	11	14	6	16	0	0	0	0	0
Aug.....	6	25	6	13	10	20	3	2	68.5	70.7	70.8	70.2	87.8	69.4	84.8	80.7	8	17	8	13	0	0	0	0	0
Sept.....	3	19	13	21	6	7	2	5	66.5	59.1	59.2	67.1	87.0	61.5	84.0	77.5	17	10	3	5	0	0	0	0	0
Oct.....	7	25	19	5	3	8	5	5	57.8	59.1	59.2	58.7	81.7	57.3	80.0	73.0	15	12	4	3	0	0	0	0	0
Nov.....	12	20	5	5	5	7	7	7	43.1	47.6	47.4	46.0	75.4	68.6	74.6	68.0	11	15	4	4	0	0	0	0	0
Dec.....	21	18	7	5	5	7	15	7	40.5	45.8	43.4	43.2	80.4	68.6	73.2	75.7	8	9	14	16	3	0	0	0	0
Sums ..	107	171	87	112	103	236	71	118	648.3	655.3	667.4	657.1	972.7	711.2	943.7	875.9	121	169	76	125	1	16	7	29	0
Means ..	Percentages.								Percentages.								Percentages.								
	9.715.6								9.421.5								34.2								

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.56 a. m., 2.56 p. m., and 10.56 p. m., local time. Correction for instrumental error of barometer used: From 6.56 a. m., January 1, to 10.56 p. m., December 31, 1884, inclusive, + 0.12 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.06; February, 0.06; March, 0.06; April, 0.06; May, 0.05; June, 0.05; July, 0.05; August, 0.05; September, 0.05; October, 0.05; November, 0.06; December, 0.06.

REMARKS.—Slight shock of an earthquake, January 18. Waterspout over Cape Fear River, March 25. First killing frost, October 24.

J. H. JONES,  
Sergeant, Signal Corps, U. S. A.

*Meteorological summary for the year ending December 31, 1884—Continued.*

WINNETUCCA, NEV.

Location of office on December 31, 1884, corner of Bridge street and Fifth avenue.

[Latitude, 40° 50' N.; longitude, 117° 48' W. Elevation of barometer above sea-level, 4,358 feet. Elevation of exposed thermometer above ground, 18 feet. Elevation of rain-gauge above ground, 8 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).								Temperature.								Precipitation.			Wind.								
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometer.				Mean maximum.	Mean minimum.	Any 3 consecutive 8-hourly measurements.		Total amount.	Maximum hourly velocity during month.			Prevailing direction.	Total movement.	
	7 p. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.			Absolute range.								
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	°	°	°	°	°	°	°	°	In.	In.	°	°	°	°	°	°	°	Miles.	
Jan.	25.614	25.611	25.609	25.611	25.627	4	25.101	26	.828	26.9	40.0	32.8	33.2	54.3	18	0	31	54.2	43.9	32.7	3.29	.82	21, 22	46	SW.	23	SW.	7,777
Feb.																												
Mar.																												
Apr.																												
May																												
June																												
July																												
Aug.																												
Sept.																												
Oct.																												
Nov.																												
Dec.																												
Sums	25.614	25.611	25.609	25.611	25.627	4	25.101	26	.828	26.9	40.0	32.8	33.2	54.3	18	0	31	54.2	43.9	32.7	3.29	.82	21, 22	46	SW.	23	SW.	7,777
Means																												

\* Observations commenced 7 a. m., December 1.



## WINNEMUCCA, NEV.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—					
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Washington time.				Washington time.				Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunder-storms.	Aurora.
										7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.									
1884																										
Jan.																										
Feb.																										
Mar.																										
Apr.																										
May																										
June																										
July																										
Aug.																										
Sept.																										
Oct.																										
Nov.																										
Dec.																										
Sums	4	26	7	2	2	45	4	2	2	17.4	21.5	20.7	19.9	68.6	49.5	61.9	60.0	5.1	5.4	5.6	4.7	3	20	0	0	
Means																										
Percentages.																	Percentages.									

NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond to 4.17 a. m., 12.17 p. m., and 8.17 p. m., local time.  
 Corrections for instrumental error of barometer used: From 4.17 a. m., December 1, to 8.17 p. m., December 31, 1884, inclusive, +.010 inch.

CHAS. A. READ,  
*Private, Signal Corps, U. S. A.*

*Meteorological summary for the year ending December 31, 1884—Continued.*

YANKTON, DAK.

Location of office on December 31, 1884, corner Third and Capitol streets.

[Latitude, 45° 54' N.; longitude, 97° 29' W. Elevation of barometer above sea-level, 1,228 feet. Elevation of exposed thermometer above ground, 20 feet. Elevation of rain-gauge above ground, 28 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.				Wind.				Total movement Miles.
	Washington time.			Monthly mean.			Washington time.				Self-registering thermometers.			Any consecutive 8-hourly measurements.			Maximum hourly velocity during month.		Prevailing direction.						
	7 p. m.	3 p. m.	11 p. m.	In.	In.	In.	Date.	Lowest.	Date.	Range.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Jan.	28.896	28.831	28.858	28.858	29.496	28.156	0	1.340	7.0	19.6	13.8	10.6	13.549.6	28.156	1.4	1.801.02	6.7	10	N.	5.923					
Feb.	28.775	28.727	28.791	28.791	29.165	27.974	18	1.191	7.3	18.3	10.6	10.6	12.151.8	28.156	1.4	1.801.02	6.7	10	N.W.	5.917					
Mar.	28.677	28.650	28.698	28.698	29.123	27.750	10	1.362	24.8	35.7	29.1	29.1	23.865.8	28.156	1.4	1.801.02	6.7	11	N.W.	5.914					
Apr.	28.668	28.632	28.698	28.698	29.143	27.086	26	1.057	27.3	50.4	42.9	42.9	23.572.1	28.156	1.4	1.801.02	6.7	11	N.W.	5.923					
May	28.685	28.645	28.641	28.657	29.047	28.310	19	1.037	51.9	69.0	57.8	57.8	23.682.5	28.156	1.4	1.801.02	6.7	11	S.W.	5.923					
June	28.663	28.627	28.664	28.671	29.063	28.394	11	1.069	64.6	80.7	69.9	69.9	23.703.8	28.156	1.4	1.801.02	6.7	11	S.W.	5.936					
July	28.681	28.622	28.627	28.637	29.119	28.247	22	1.066	64.6	78.8	69.9	69.9	23.703.8	28.156	1.4	1.801.02	6.7	11	S.E.	5.936					
Aug.	28.725	28.690	28.696	28.700	29.030	28.235	19	1.095	61.9	77.7	67.4	67.4	23.888.4	28.156	1.4	1.801.02	6.7	11	S.E.	5.936					
Sept.	28.710	28.684	28.691	28.698	29.057	28.185	2	1.072	58.8	74.1	62.0	62.0	23.888.4	28.156	1.4	1.801.02	6.7	11	S.	5.918					
Oct.	28.744	28.716	28.717	28.726	29.124	28.431	19	1.093	48.4	63.1	62.1	62.1	23.888.4	28.156	1.4	1.801.02	6.7	11	S.W.	5.918					
Nov.	28.808	28.772	28.798	28.799	29.203	28.268	26	1.038	27.3	43.4	33.0	33.0	23.566.3	28.156	1.4	1.801.02	6.7	11	S.W.	5.943					
Dec.	28.829	28.804	28.841	28.825	29.309	28.244	8	1.155	8.3	16.8	10.4	10.4	23.566.3	28.156	1.4	1.801.02	6.7	11	N.W.	5.974					
Sums	344.756	344.861	344.545	344.553	344.750	344.553	11	11.975	558.0	627.6	518.6	518.6	344.553	344.553	11	11.975	558.0	627.6	518.6	72.016					
Means	28.790	28.697	28.712	28.713	29.496	28.750	110	.928	38.2	53.3	43.3	43.3	44.988.8	28.712	1.4	1.801.02	6.7	11	N.	5.923					

• January.

† March.

‡ June.

§ July.

**YANKTON, DAK.—Continued.**

[illegible]

**\* Ten days only.**

**† June.**

**t December.**

**NOTE.**—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.38 a. m., 1.38 p. m., and 9.38 p. m., local time.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.38 a. m., 1.38 p. m., and 9.38 p. m., local time. Correction for instrumental error of barometer used: From 5.38 a. m. January 1, to 9.38 p. m., December 31, 1884 inclusive, +.011 inch.

Correction for instrumental error of barometer used: From 6.38 a. m. January 1, to 9.38 p. m., December 31, 1884, inclusive, + .011 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.49; February, 1.49; March, 1.39; April, 1.34; May, 1.34; June, 1.34; July, 1.34; August, 1.34; September, 1.34; October, 1.34; November, 1.34; December, 1.34.

**REMARKS.**—January 1 and 3, solar halo; February 5 and 12, solar halo; February 5 and 13, parheliion; April 24, aurora; December 31, solar halo.  
1.28; June, 1.23; July, 1.27; August, 1.27; September, 1.29; October, 1.33; November, 1.38; December, 1.43.

**E. H. THOMPSON,**  
*Corporal, Signal Corps, U. S. A.*

*Meteorological summary for the year ending December 31, 1884—Continued.*

YUMA, ARIZ.

Location of office on December 31, 1884, quartermaster's office.

[Latitude, 29° 49' N.; longitude, 114° 30' W. Elevation of barometer above sea-level, 141 feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain-gauge above ground, 21 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.							Precipitation.		Wind.		Total movement.
	Washington time.			Monthly mean.	Highest.	Lowest.	Range.	Washington time.				Self-registering thermometers.				Total amount.	Any 3 consecutive 8-hourly measurements.	Maximum hourly velocity during month.	Prevailing direction.			
	7 a. m.	3 p. m.	11 p. m.					Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.								
1884.	29.975	29.988	29.972	29.978	29.485	1.534	47.5	62.0	58.7	54.6	71.7	12	38.6	18	35.1	15-17	33	N.	23	Miles. 4,582 4,700 4,364 4,454 3,942 3,558 4,909		
Jan.	29.872	29.904	29.885	29.887	29.203	1.763	51.5	63.6	55.9	57.3	84.2	26	34.1	14	30.1	3	30	N.	6			
Feb.	29.801	29.836	29.810	29.816	29.554	1.497	53.4	68.9	60.9	60.9	81.3	18	42.6	81	38.7	3	4	N.W.	23			
Mar.	29.756	29.776	29.738	29.757	29.038	1.523	53.6	78.1	67.6	67.4	95.0	23	45.1	28	49.9	27	23	W.	15			
Apr. <sup>1</sup>	29.710	29.724	29.690	29.708	29.892	1.545	63.4	87.0	75.6	75.3	104.2	8	48.9	2	55.3	19	23	W.	18			
May	29.653	29.674	29.628	29.652	29.846	1.400	66.6	93.5	82.1	81.7	113.2	30	58.4	14	54.8	5	6	SE.	10			
June	29.638	29.659	29.608	29.635	29.798	1.331	70.4	102.1	90.2	90.6	111.6	5	67.8	17	43.8	15	30	SE.	15			
July	29.648	29.668	29.619	29.648	29.849	1.250	78.2	99.2	88.2	88.9	111.6	6	68.5	19	43.1	103.5	77.1	1.38	15			
Aug.	29.649	29.674	29.633	29.652	29.909	1.557	68.7	90.5	79.7	80.0	104.0	20	56.2	8	47.8	94.6	67.8	1	18			
Sept. <sup>1</sup>	29.728	29.740	29.737	29.735	29.913	1.638	62.7	82.2	70.3	71.7	99.5	10	49.6	3	49.9	86.8	60.9	1	20			
Oct.	29.840	29.850	29.838	29.843	30.035	1.449	53.7	74.6	61.6	63.8	87.3	9	43.1	27	44.2	78.0	51.8	1	8			
Nov.	29.721	29.808	29.802	29.800	30.211	1.747	46.6	60.8	51.7	53.0	78.5	1	36.4	11	42.1	63.3	43.5	1.96	9			
Dec.	387,040	357,301	356,971	357,111	.....	6,429	738.3	903.1	834.1	844.7	.....	.....	.....	.....	554.8	1,010.5705.5	5.86	.....	.....			
Sums	29.755	29.775	29.748	29.759	30.485	1.536	61.7	80.3	69.8	70.4	113.2	730	34.1	114	46.2	84.2	58.8	.....	.....			
Means																						

<sup>1</sup> Insuperable.  
<sup>2</sup> No observation taken on the 12th.  
<sup>3</sup> One 7 a. m. observation missed.

\* For 24 days only.  
 \* January.

\* October.  
 \* June.

\* February.  
 \* For 300 days only.

## YUMA, ARIZ.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—							River.												
															Thunder-storms.																			
															Clear.	Part.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 82°.	Minimum below 82°.	Maximum above 90°.													
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Part.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 82°.	Minimum below 82°.	Maximum above 90°.	Thunder-storms.	Highest.	Date.	Lowest.	Date.	Range.	Mean.				
1884.																																		
Jan....	25	22	2	14	4	0	0	15	11	27.3	24.9	30.7	27.5	51.0	51.0	51.0	16	10	10	0	0	0	0	0	0	21	3	12	14	5	1	10	17 9.7	
Feb....	24	11	1	13	3	0	0	10	13	39.1	36.9	39.3	38.4	68.9	68.9	68.9	68.9	15	11	11	0	0	0	0	0	27	2	11	17	0	27	10	2	19 7.4
Mar....	7	5	4	10	8	16	20	11	12	42.1	34.4	40.9	40.9	68.5	68.5	68.5	68.5	11	13	13	0	0	0	0	0	20	4	21	17	8	1	8	18 7.6	
Apr....	3	6	5	8	10	15	19	14	7	44.1	39.5	42.5	42.0	64.3	64.3	64.3	64.3	19	8	8	0	0	0	0	0	28	2	31	18	8	1	6	27 8.0	
May....	0	3	5	15	6	22	11	18	6	48.9	41.2	47.2	45.8	61.5	61.5	61.5	61.5	21	7	7	0	0	0	0	0	28	4	26	27	26	3	1	2	27 8.0
June....	0	3	8	18	9	23	9	11	5	56.4	47.4	54.0	52.6	63.8	63.8	63.8	63.8	24	6	6	0	0	0	0	0	27	6	13	14	20	9	1	6	24 7.7
July....	1	4	8	23	6	28	9	11	6	64.1	63.4	65.1	64.9	67.7	67.7	67.7	67.7	24	6	6	0	0	0	0	0	26	6	10	6	1	15	6	18 8.7	
Aug....	4	8	6	18	8	30	5	11	6	66.1	63.4	65.1	64.9	67.7	67.7	67.7	67.7	24	6	6	0	0	0	0	0	26	6	10	6	1	15	6	18 8.7	
Sept....	2	12	9	18	10	17	6	20	5	67.0	60.7	63.4	63.7	67.6	67.6	67.6	67.6	22	8	8	0	0	0	0	0	16	4	24	14	10	7	1	6	16 3.0
Oct....	2	34	7	1	1	13	2	25	8	61.0	51.8	53.1	52.0	68.0	68.0	68.0	68.0	22	8	8	0	0	0	0	0	15	10	4	14	1	30	1	9	15 1.1
Nov....	1	50	1	2	1	8	0	14	13	45.7	50.5	47.7	48.0	75.4	75.4	75.4	75.4	23	7	7	0	0	0	0	0	15	9	30	13	6	2	3	14 7.3	
Dec....	6	44	1	7	3	5	0	22	5	40.9	44.2	44.7	43.3	82.1	82.1	82.1	82.1	15	13	13	4	9	0	0	0	15	9	30	13	6	2	3	14 7.3	
Sums..	78	204	52	134	76	182	90	180	99	583.1	540.5	583.0	569.0	765.9	765.9	765.9	765.9	237	97	97	30	30	0	0	143	1	.....	.....	.....	50	3	225	9.0	
Means..	7.1	18.6	4.8	12.2	6.9	10.9	9.8	21.6	9.9	48.6	45.0	48.6	47.4	66.4	66.4	66.4	66.4	2.65	1.25	1.25	3.3	3.3	0.0	0.3	28	4	26	27	13	5	2.3	4	2.2	18 9.8

1 December.

1 June.

Note.—7 a. m., 8 p. m. and 11 p. m., Washington time, correspond to 4.30 a. m., 12.30 p. m. and 8.30 p. m. local time.  
 Correction for instrumental error of barometer used: From 4.30 a. m., January 1, to 8.30 p. m., December 31, 1884, inclusive, — .011 inch.  
 The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.150; February, 0.150; March, 0.150; April, 0.150; May, 0.150; June, 0.150; July, 0.150; August, 0.140; September, 0.140; October, 0.140; November, 0.150; December, 0.150.

J. T. BARBER.  
*Private, Signal Corps, U. S. A.*

## APPENDIX 53.

## DESCRIPTION OF DISTRICTS FOR WHICH INDICATIONS ARE PUBLISHED.

*Eastern Gulf States.*—Mississippi, Alabama, western Georgia, northwestern Florida, and the portion of Louisiana lying east of the Mississippi river.

*Extreme Northwest.*—A belt of country about 170 miles broad, extending from Duluth, Minn., to Fort Buford, Dak.

*Lower Lakes.*—A belt of country about 80 miles wide extending from Lake Champlain to the Indiana state line, including the region south of and adjacent to Lakes Erie and Ontario, and southeastern Michigan.

*Middle Atlantic States.*—New Jersey, Delaware, the District of Columbia, and the portions of New York, Pennsylvania, Virginia, and Maryland lying east of the Alleghenies.

*Middle Pacific Region.*—That portion of California west of the Sierra Nevadas and north of the thirty-seventh parallel of latitude.

*Middle Plateau.*—Western Colorado and those portions of Nevada and Utah lying north of the thirty-seventh parallel of latitude; the southwest corner of Wyoming and the portion of California lying east of the Sierra Nevadas and north of the thirty-seventh parallel of latitude.

*Middle Slope.*—Eastern Colorado, southwestern Nebraska, western Kansas, northwestern portion of the Indian Territory, a portion of northern Texas, and also of northeastern New Mexico.

*Missouri Valley.*—A belt of country 200 miles broad, extending southeast from the forty-sixth parallel of latitude to the Arkansas state line.

*New England States.*—Maine, New Hampshire, Vermont, Massachusetts, Connecticut, and Rhode Island.

*Northern Slope.*—The portions of Montana and Wyoming lying east of the Rocky Mountains, southwestern Dakota, and northwestern Nebraska.

*North Pacific Region.*—The portions of Oregon and Washington Territory lying west of the Cascade range.

*Northern Plateau.*—A portion of western Wyoming, western Montana, Idaho, and the portions of Oregon and Washington Territory lying east of the Cascade range.

*Ohio Valley and Tennessee.*—The belt of country, about 350 miles broad, including Tennessee, Kentucky, southeastern Illinois, southern Indiana, and Ohio, southwestern Pennsylvania, and West Virginia.

*Rio Grande Valley.*—That portion of southwestern Texas between the Rio Grande and Rio Colorado rivers below the junction of the Rio Pecos with the Rio Grande.

*South Atlantic States.*—North and South Carolina; the portion of Georgia east of the eighty-fourth meridian; and northeastern Florida.

*Southern Slope.*—Southeastern New Mexico, central and western Texas.

*South Pacific Region.*—The portion of California west of the Sierra Nevadas and south of the thirty-seventh parallel of latitude.

*Southern Plateau.*—Western New Mexico, Arizona, and southeastern California.

*Upper Lakes.*—Lakes Huron, Michigan, and Superior with adjacent territory.

*Upper Mississippi Valley.*—The belt of country, about 250 miles broad, between Superior, Wis., and Breckenridge, Minn., on the north, and the Arkansas state line on the south.

*Western Gulf States.*—Arkansas, the portion of Louisiana west of the Mississippi river, the southeastern portion of Indian Territory, and eastern Texas.

## APPENDIX 54.

## REPORT ON THE DISPLAY OF COLD-WAVE SIGNALS.

SIGNAL OFFICE, WAR DEPARTMENT,  
Washington City, June 30, 1885.

SIR: I have the honor to submit my report upon the work performed in connection with the predictions of cold waves and the display of the cold-wave signal for the year ending June 30, 1885, prefacing the report with a brief history of this recent though important branch of Signal-Service work.

There is scarcely an industry which is not more or less affected by a sudden and marked fall in temperature; and especially is this true of agriculture, stock-farming, cotton-planting, and fruit-shipping. Dealers in perishable goods, packed meats, and many others are also unfavorably affected by unexpected changes in temperature.

This service has long appreciated the value of such information, but it was not until late in 1883 that it was possible to inaugurate the work of giving warnings of the approach of cold waves from twenty-four to forty-eight hours in advance of their appearance.

The plan adopted and now in successful operation is as follows:

Whenever it is anticipated that the temperature will fall suddenly from 15° to 30°, or more, in any section of the United States, the observers in charge of Signal-Service stations in that section are directed, by telegraph, from twenty-four to forty-eight hours in advance, to hoist the cold-wave signal at their stations. The telegrams give the number of degrees that the temperature is expected to fall, and, immediately on their receipt, the observers at the stations selected, display the cold-wave flag from a high staff erected either on the office building, or at some prominent point in the city where the signal is conspicuous and readily seen by the public. The cold-wave signal is a white flag, 6 or 8 feet square, with a black center about 2 feet square. The signal is lowered upon receipt of orders from this office, when it is believed the temperature has reached the minimum. At stations other than Signal-Service stations the signal is lowered twenty-four hours after the order to hoist is received.

By sending out the warnings in this manner, all persons whose business is liable to be affected by cold weather, or sudden changes in temperature, are enabled to take the precautions necessary by being informed in ample time of the approach of cold waves.

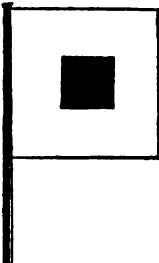
The system of warnings thus inaugurated met with immediate favor throughout the entire country, and the press in most emphatic terms indorsed the efforts made by the service. All branches of agriculture, the railroad companies, extensive fruit dealers, cotton-planters, manufacturers, and others expressed the greatest satisfaction with the system, and in many instances individuals have expended considerable money in order to obtain additional information by telegraph, in the purchase of flags, and in the erection of flag-staffs in towns adjacent to Signal-Service stations.

The railroad and telephone companies have, almost without exception, co-operated with the service in disseminating the information by telegraph and telephone to the cities and stations on their lines. This is done without any expense whatever to the Government, the cold-wave messages sent from this office to the various Signal Service stations being duplicated at those places and sent by the observers to the managers of the railroad and telephone lines for transmission.

All means available are used by the service in giving publicity to the cold-wave warnings, in order that the greatest benefit possible may result from each forecast.

The warning is published in the Farmers' Bulletin, in bold type, and thousands of farmers are thus informed of the coming fall in temperature.

A large number of circulars have been prepared and forwarded to the postmasters who receive the information through the Farmers' Bulletin, giving the cost of cold-wave flags and soliciting their co-operation in displaying the signal at their post-offices whenever the warning is published.



Cold-wave signal.

Any one not in the vicinity of a Signal Service station can obtain the warnings by paying the cost of telegraphing.

During the present year this system has been greatly improved and extended. The number of stations displaying the signal has been increased and additional facilities employed for disseminating the warnings.

Owing to the very limited appropriations made for the Signal Service, this office has been able to furnish flags only to regular stations of the service and to pay the cost of telegraphing the reports. An annual appropriation of a few thousand dollars would enable the system of cold-wave warnings to be extended over the greater part of the United States, to the benefit of thousands who cannot under existing conditions be brought within the scope of its usefulness.

The following are the instructions governing observers in displaying the cold-wave signal:

The signal is hoisted upon the receipt of a message from this office to "hoist cold-wave signal;" and lowered upon the receipt of the message "cold-wave signal down."

The receipt of orders to hoist or lower cold-wave signals is acknowledged by telegraph thus: "Hoist cold-wave signal received 10 a. m.; cold-wave signal down received 7 p. m." A report by letter is made after each display, stating whether the signal was or was not justified, and giving the maximum and minimum temperatures during the display. This letter also states whether the warning was considered by the business interests and the public generally as being sufficiently in advance to be of decided benefit. Clippings from local newspapers, commenting upon the display, or showing any advantages that may have resulted therefrom, are attached to these letters.

Two copies of Form 112b (record of cold-wave signals) are made out each month; one copy is forwarded to this office, the other is filed with the station records.

Observers communicate with the several railroad, telegraph, and canal officials at their stations, furnish them copies of cold-wave orders, and endeavor to secure their co-operation in sending the messages to all points under their control without cost to the United States, as the results of such wide distribution of these dispatches are found to be of great benefit to the general public. Notes are made on Form 112b showing the names of persons, firms, and companies to which each message is given.

Cold-wave signals are not ordered unless a temperature of 45°, or lower, is anticipated. When the temperature is expected to fall 20°, or more, in any district, and not reach 45°, a "cool wave approaching" is announced in the indications issued from this office. No signals are displayed for cool waves, nor are cold-wave stations notified in any other manner than through announcement made in the indications. Printing stations give the "cool wave approaching" announcement such prominence as their facilities will permit when it refers to the district in which the printing station is located.

At stations where cautionary signals are displayed, and only one flag-staff is available, the cautionary signal has preference—that is, the cold-wave flag gives way to the cautionary flag under all circumstances.

At stations where no flag-staff is available on the building in which the office is located, the observer endeavors to obtain permission from some one in the vicinity of the office, who has a flag-staff, to use it for displaying the cold-wave flag, without expense to the United States.

Under no conditions are the cold-wave flag and the cautionary signal displayed on the same staff at the same time.

The following is an extract from a letter dated June 26, 1885, from Hon. J. F. Webb, mayor of the city of Lebanon, Ill.:

"I consider the cold-wave signal of more practical benefit to the public at large than any recent improvement in the United States Signal Service. I know, personally, of many instances during the past winter where farmers were saved from serious losses, in the shipment of potatoes and apples, by the timely warning of the cold-wave signal. Other instances I know by report, where losses were sustained in the shipment of live-stock (cattle and hogs) by neglecting or disregarding the warning.

"Our citizens and farmers have learned to rely on the forecasts given, almost implicitly, and it is not too much to say that in my judgment the property saved by its use during the past severe winter in the Mississippi Valley would pay for its maintenance for a generation."

The following extracts are from the reports of our observers, and indicate the importance attached to the cold-wave warnings and their value in leading to the preservation of property.

*Albany, N. Y.*: "Great reliance is placed on these warnings and much satisfaction is expressed by every one in regard to them. It is difficult to estimate the pecuniary benefits realized." (Letter November 25, 1884.)

"Have furnished warnings to Delaware and Hudson Canal Railroad Company and to the superintendent of canals. The canal company transmit the information over their



wires free of charge. The railroad officials seemed much interested in this matter, and offered to do anything that has been done by other companies." (Letter November 25, 1884.)

"All displays during January, 1885, have been justified. This manner of publishing predictions in advance of cold-waves is more popular than through any other course yet adopted. Office is visited by scores of people. Dealers in fruit, oysters, and fish, and the ice companies are specially interested." (Form 112b, January, 1885.)

"The interest in these warnings is constantly increasing." (Form 112b, March, 1885.)

*Atlanta, Ga.:* "The following railroad companies send the warnings to points on their roads, namely: Richmond and Danville, the Western and Atlantic, Central, Atlanta and West Point, and Georgia Pacific." (Letters November 26, 1884, and January 13, 1885.)

*Auburn, Ala.:* "These signals are of great benefit to physicians, gardeners, farmers, and grocers." (Form 112b, December, 1884.)

"All cold-wave predictions this winter have been verified. The people have been greatly interested." (Form 112b, March, 1885.)

*Bangor, Me.:* "Signals are of great benefit to persons engaged in storing ice." (Form 112b, January, 1885.)

*Baltimore, Md.:* "Arrangements have been made for furnishing copies of the orders to the Baltimore and Ohio Telegraph and Railroad, Western Union, and Bankers' and Merchants' Telegraph Companies. The officials state that they will give the information the widest publicity possible through their numerous offices in this city." (Letter November 3, 1884.)

"The importers of tropical fruits realize great benefit from the warnings, as they are enabled to protect their fruits on the wharves, and in exposed places, also during transit on the cars to distant points. The oyster-packers are also greatly benefited as, on notice being given of the approach of a cold-wave, they make large shipments of oysters to western cities, where they are readily sold." (Letter November 25, 1884.)

*Buffalo, N. Y.:* "Cold-wave orders are sent to all telephone, telegraph, and railroad officials, and by them distributed over their several sections. The orders are also published in every paper printed in Buffalo." (Letter November 2, 1884.)

"Produce dealers receive much benefit from these warnings and state that goods are shipped on the strength of Signal Service reports." (Letter November 19, 1884.)

"All the cold-wave signals displayed during January gave general satisfaction to the public, and are considered by the press and public as the best information issued by the Service." (Form 112b, January, 1885.)

"Produce merchants, roofers, fish and ice dealers, express companies, &c., acknowledge great service rendered by the displays." (Form 112b, March, 1885.)

*Boston, Mass.:* "The following railroads will send these warnings to the stations along their roads, viz: Old Colony; New York and New England; Boston and Maine; Boston and Lowell; and Eastern." (Letter November 15, 1884.)

*Cairo, Ill.:* "The following railroads transmit the warnings over their wires to points on their roads, viz: Illinois Central; Wabash, Saint Louis and Pacific; Mobile and Ohio; Iron Mountain; and Texas and Saint Louis narrow gauge." (Letter December 13, 1884.)

"The display of December 15-19, 1884, resulted in saving four car-loads of perishable stuff; the steamers of the Anchor Line were telegraphed and sought good harbors; and a number of valuable tropical animals belonging to a menagerie were comfortably housed." (Letter December 21, 1884.)

"Farmers and dealers in perishable stuffs saved goods valued in all at \$3,400." (Form 112b, March, 1885.)

*Chicago, Ill.:* "The following railroad companies will send the warnings, viz: Chicago and Alton; Chicago and Grand Trunk; Chicago, Rock Island and Pacific, and Chicago and Eastern. The Baltimore and Ohio Telegraph Company will also send them." (Letter November 27, 1884.)

*Cleveland, Ohio:* "The following railroad companies transmit the warnings over their lines, viz: Cleveland, Columbus, Cincinnati and Indianapolis; New York, Portland and Ogdensburg; Lake Shore and Michigan Southern; New York, Chicago and Saint Louis." (Letter November 26, 1884.)

"The service has been very accurate in these warnings. The public now have unbounded confidence in the weather department. The observer is often consulted by interested parties and great benefit is derived." (Form 112b, February, 1885.)

*Chattanooga, Tenn.:* "The Western and Atlantic and the Georgia division East Tennessee and Virginia Railroad Companies will adopt any feasible plan for distributing the cold-wave information over their lines." (Letter November 27, 1884.)

"Displays are watched with interest and acted upon by the public." (Form 112b, November, 1884.)

"Farmers across the Tennessee river look for the warnings and will request the county court to expend \$50 for additional flag-staff." (Form 112b, January, 1885.)

*Cincinnati, Ohio*: "Warnings will be telegraphed by the following railroad companies to all stations on their roads, viz: Cincinnati, New Orleans and Texas Pacific; Cincinnati, Indianapolis, Saint Louis and Chicago; Cincinnati, Louisville and Nashville; Cleveland, Columbus, Cincinnati and Indianapolis; Cincinnati, Washington and Baltimore; Pittsburg, Cincinnati and Saint Louis, and the Ohio and Mississippi." (Letter November 8, 1884.)

"Produce and fruit merchants, florists and gardeners much interested." (Forms 112b, November, 1884, and March, 1885.)

*Columbus, Ohio*: "Signals are watched closely by the public and business men, and the warnings are received with great favor." (Forms 112b, November and December, 1884.)

*Davenport, Iowa*: "The following railroad companies will promptly send the warnings to all places under their control, viz: Chicago, Rock Island and Pacific; Chicago, Burlington and Quincy; Chicago, Milwaukee and Saint Paul. They will also be sent by the Western Union Telegraph Company. The manager of the Chicago, Rock Island and Pacific has consented to attach a flag, similar to the cold-wave flag, to all express trains on this division of the road." (Letter December 4, 1884.)

*Des Moines, Iowa*: "Arrangements are completed with the manager of the telegraph company to transmit cold-wave warnings over all the wires from his office. This includes the wires of the several railroad companies." (Letter November 28, 1884.)

"The warning of December 30, 1884, enabled the railroad companies to save about all of their perishable freight." (Letter January 3, 1885.)

"Warnings are of great value to the railroad officials and to shippers of perishable goods." (Form 112b, January, 1885.)

*Detroit, Mich.*: "The newspapers spread the information throughout the State; commission merchants show great interest in the signal; the service can congratulate itself upon the success that has attended the display of cold-wave signals at this station." (Letter October 23, 1884.)

"The Board of Trade is highly pleased with the success of this signal in Detroit. Telephone calls are received daily from Pontiac and Almont, Mich., during cold snaps, relative to the weather. The signal fills a long felt want. The Detroit, Lansing and Northern Railway will transmit all cold-wave warnings over their wires." (Letter November 19, 1884.)

"Mr. A. H. Boies, Hudson, Mich., states that he has nearly completed arrangements for the display of cold-wave signals by establishing a circuit of flag-poles among the farmers for miles around, using his station as a central point for disseminating the warnings. The warnings are sent from Detroit by telegraph to Mr. Boies." (Letter May 21, 1885.)

*Galveston, Tex.*: "The observer has made arrangements with the various railroad companies and the press by which the warnings are given general circulation." (Letter November 15, 1884.)

*Greencastle, Ind.*: "Warnings are beneficial to all classes. The displays have led to great interest in weather changes and study of meteorological reports by the people." (Forms 112b, November, 1884, and February, 1885.)

*Jacksonville, Fla.*: The meteorological committee state that "the establishment of the cold-wave warning signal at Jacksonville is highly appreciated by the board of trade and by the citizens of Florida generally." (Letter December 3, 1884.)

"Warnings are beneficial to fruit and vegetable growers. Fires are built in groves in the vicinity for the protection of fruit, &c." (Form 112b, December, 1884.)

*Keokuk, Iowa*: "Warnings are sent over the lines of the Saint Louis, Keokuk and Northwestern Railroad and the Chicago, Rock Island and Pacific Railroad." (Letter November 27, 1884.)

"The Chicago, Rock Island and Pacific Railroad Company contemplate carrying miniature cold-wave flags on all their passenger trains leaving Keokuk. If done, this will give the warnings great publicity." (Letter December 14, 1884.)

"Railroad and ice companies, fruit-dealers, and shippers of potatoes, especially benefited." (Forms 112b, January and February, 1885.)

*Leavenworth, Kans.*: "Warnings will be promptly transmitted to all points on the Chicago, Rock Island and Pacific Railroad, and the Kansas Central Division Union Pacific Railroad." (Letter November 26, 1884.)

"Every signal display during January, 1885, was decidedly useful to the business interests in this vicinity, and the public generally keep a close lookout for the warnings, and appreciate them." (Form 112b, January, 1885.)

*Little Rock, Ark.*: "The reports are furnished the chief operators Memphis and Little Rock Railroad; Fort Smith and Little Rock Railroad; Little Rock, Mississippi River and Texas, and the Saint Louis, Iron Mountain and Southern Railroad, who send them to every operator along the lines, with instructions to make the information as public as possible.

The railroad companies give hearty support to anything which tends to improve crops or the condition of the country." (Letter November 16, 1884.)

*Logansport, Ind.*: "The cold-wave warnings are of vast benefit to the farmers and citizens here. Hundreds read the 'Farmers' Bulletin.' Both the press and public are pleased that these warnings are given. The signals have brought the service and its workings prominently before our people. As soon as the flag is raised here the trainmen inform the small offices along the road, and thus the flags at these stations are raised within an hour or so after the one here. Adjacent towns receive telegrams at their own expense." (Forms 112b, October and November, 1884, January and February, 1885.)

*Louisville, Ky.*: "Copies of cold-wave warnings are furnished the Ohio Valley Telephone Company; Chesapeake, Ohio and Southwest, and Louisville and Nashville Railroads and will be transmitted over their lines to 108 points in Kentucky, Tennessee, and Indiana. There are 96 railroad and 12 telephone stations." (Letter November 4, 1884.)

*Milwaukee, Wis.*: "The cold-wave displays are greatly appreciated by commission and railroad men. A great amount of property has been saved by the warnings." (Letter December 21, 1884.)

"The general superintendent Chicago, Milwaukee and Saint Paul Railway states 'This is the kind of information I am always glad to get; please let me have such at any time, for it will be of advantage to us, and will keep the people along our lines posted.'" (Letter October 22, 1884.)

*Memphis, Tenn.*: "Cold-wave warnings are telegraphed by the following railroad companies to stations along their lines, viz: Memphis and Charleston; Chesapeake, Ohio and Southwestern, and Louisville and Nashville. The Telephone Exchange and Pacific Express Company also send the messages to all stations on their lines." (Letter November 24, 1884.)

"Displays are beneficial to farmers, river men, business men, horticulturists, and shippers of produce." (Forms 112b, January and February, 1885.)

*Nashville, Tenn.*: "Secretary Baker, of the Cumberland Telephone Exchange, repeats cold-wave warnings to 87 towns in Tennessee and Kentucky." (Letter December 4, 1884.)

"Copies of warnings are delivered to the superintendent Louisville and Nashville Railroad, president Nashville, Chattanooga and Saint Louis Railroad, manager Western Union Telegraph office, Nashville. These gentlemen express themselves as more than grateful for these advantages." (Letter November 7, 1884.)

Additional cold-wave flags are displayed from the Capitol building and the Penitentiary at Nashville; Meness & Patton's drug store, Springfield, Tenn.; J. W. Wallace's office, Shelbyville, Tenn.; Prewitt & Co's. mill, the buildings of the National Manufacturing Company, and the Southern Pump Company, in Nashville, and at Mr. J. H. Jordan's house, 7 miles from Nashville. (Form 112b, February, 1885.)

"The mayor of Gallatin, Tenn., contemplates the erection of a flag-staff for the display of cold-wave signals, and it is learned that other towns within a radius of 90 miles of Nashville intend to do the same." (Letter December 23, 1884.)

*New Haven, Conn.*: The chairman of the meteorological committee Chamber of Commerce, in letter of February 2, 1885, states: "The cold-wave signal recently added has proven and will continue to prove of great value, not only to our market gardeners, nurserymen, and florists, but to a very large industry, viz: The oyster trade, as it gives those engaged in it warnings of the changes in temperature, consequently the best time to manipulate the products of their trade. This industry has of late years become of great value, as in the waters of Long Island Sound, on the Connecticut shore contiguous to us, there are over 4,500 acres under oyster cultivation which, in the near future, will represent an interest of millions of dollars."

*New Orleans, La.*: "Cold-wave warnings are sent to all the principal points reached by the Western Union Telegraph Company in Louisiana; all the larger towns on the Texas and Pacific Railroad; all along the line of the Morgan's Louisiana and Texas Railroad; the Ocean Tow-boat Telegraph line transmits all order to Port Eads and Point a la Hache; the two Lance Coast Packet boats carry flags for the benefit of sugar planters along the lower coast." (Letter November 29, 1884.)

*New York City, N. Y.*: "Cold-wave signals have met with universal favor and are deemed of particular value by the members of the different exchanges." (Letter October 16, 1884.)

"Warnings are telegraphed over the New York, Ontario and Western Railroad lines. Arrangements have been made by which all the exchanges, principal business houses, theaters, clubs, hotels, &c., in New York, Brooklyn, and Jersey City are advised of the approach of cold waves within a few minutes of the receipt of the orders. The New York Central and Hudson River Railroad and the New York, West Shore and Buffalo Railroad also receive the information." (Letters November 11 and December 3, 1884.)

*Norfolk, Va.:* On June 9, 1885, the general manager Norfolk Southern Railroad Company issued the following order:

"From July 1 proximo the United States Signal Service warnings of the approach of cold waves indicating a fall of temperature below 45° will be announced from Berkley to telegraph stations on line of this railroad. Operators at those stations will forward the warnings to Centreville, Shawborough, Okisko, Hickory Ground, Camden Court House, and Windfall by the first train.

"On receipt of the warnings, agents will immediately display the cold-wave signal, a white flag with black centre, from the flag-staff on the station platforms, and keep it displayed for the number of hours mentioned in the order, when it should be lowered unless a second warning is received.

"Operators will duplicate the order, as received, for distribution to above-named stations; and agents will post the same at all stations where received.

"The warnings will be given from twenty-four to forty-eight hours in advance of the cold wave, and will indicate probable duration and fall of temperature.

"In this matter the railroad company co-operates with the United States Signal Service for the benefit of agricultural interests along the road; and agents will be expected to make every effort to give the undertaking practical effect."

*Philadelphia, Pa.:* "Warnings are of benefit to vegetable and fruit shippers and oystermen, and have become almost indispensable." (Form 112b, March, 1885, and letter April 4, 1885.)

*Rochester, N. Y.:* "The benefits derived from these warnings are very general to all classes. Shippers of perishable produce and dealers in fresh meats are greatly benefited. The warnings are duplicated by flag at Richmond Mills (8 miles south of city) and give great satisfaction to the farmers and millers in that vicinity." (Forms 112b, December, 1884, and January, 1885.)

*Shreveport, La.:* "Warnings are telegraphed over the Texas and Pacific Railroad, and the New Orleans Pacific Railroad." (Letter December 17, 1884.)

"Of great benefit to dealers in fruit and produce and there is a feeling of much satisfaction and interest in the cold-wave signals at this point." (Letter December 18, 1884.)

"The display of December 16, 1884, resulted in saving \$3,500 worth of goods." (Letter December 19, 1884.)

"The telephone companies co-operate in distributing the warnings to neighboring towns." (Letter January 13, 1885.)

*Toledo, Ohio:* "The following railroads and telegraph companies have promised hearty co-operation in distributing the cold-wave warnings, viz: Lake Shore and Michigan Southern; Dayton and Michigan; Columbus, Hocking Valley and Toledo; Toledo and Ann Arbor; Pennsylvania and Northwestern Ohio; Toledo, Cincinnati and Saint Louis; Wheeling and Lake Erie; Ohio Central; Toledo and Indianapolis; Michigan and Ohio; Western Union, and Bankers and Merchants' Telegraph companies." (Letter November 27, 1884.)

"Arrangements will be made by which the warnings will reach more than 200 towns in Ohio, Michigan and Indiana." (Form 112b, November, 1884.)

*Pittsburg, Pa.:* "Warnings are telegraphed over the lines of the Allegheny Valley Railroad and the Pittsburg division Baltimore and Ohio Railroad." (Letters November 19, 1884, and December 6, 1884.)

"Great interest is manifested by the public. During displays visitors are almost continuously in the office after information. Shippers of goods, coal and river men, and people in all avocations, are interested in these warnings." (Form 112b, January, 1885.)

*Saint Louis, Mo.:* "Warnings will be sent to all stations on the following roads, viz: Saint Louis and San Francisco; Louisville and Nashville; Saint Louis and Cairo; Wabash, Saint Louis and Pacific; and Saint Louis, Keokuk and Northern." (Letter November 15, 1884, local records December, 1884, and January, 1885.)

"Warnings during January were of extraordinary value to the merchants, railroads, and farmers in this section of the country. Many inquiries were made by merchants and at the exchanges and much valuable information was given." (Form 112b, January, 1885.)

"The warnings are of special benefit to gardeners, roofers, dealers in oysters, fruit, and vegetables, farmers, ice-packers, railroads, and dealers in live stock." (Forms 112b, November and December, 1884, and February, 1885.)

*Washington, D. C.:* Warnings are telegraphed over the lines of the following railroads, viz: Baltimore and Potomac; Alexandria and Fredericksburg; Pope's Creek; Washington, Ohio and Western; Chesapeake and Ohio; and Virginia Midland; also over the telegraph lines of the Chesapeake and Ohio Canal Company. The Chesapeake and Potomac Telephone Company send all cold-wave messages over their lines to Frederick, Hagerstown, Westminster, and Baltimore, and from these cities to all connecting points in Fred-

erick, Carroll, and Baltimore Counties. Whenever cold waves are expected to occur in the sections traversed by the Baltimore and Ohio Railroad, warnings of their approach are telegraphed to Superintendent Selden, Baltimore; General Superintendent Zeuhlin, Chicago; and Superintendent Leslie, New York City. The following are the States included in this system: New York, New Jersey, Pennsylvania, Maryland, Virginia, West Virginia, Ohio, Indiana, Illinois, and Kentucky. (Letters November 14, November 29, and December 29, 1884.)

Whenever cold-wave signals are ordered for Washington notification of the fact is telegraphed to Messrs. W. S. Meyer & Bro., Westminster, Maryland. (Instructions September 18, 1884.)

The following is a list of the regular Signal Service stations at which the cold-wave signal is displayed:

Name of station.	Established.	Name of station.	Established.
Albany, N. Y.....	Mar. 28, 1884	Leavenworth, Kans.....	July 30, 1884
Atlanta, Ga.....	Nov. 6, 1884	Little Rock, Ark.....	May 17, 1884
Augusta, Ga.*.....	Apr. 4, 1885	Logansport, Ind.....	July 30, 1884
Bangor, Me.....	July 30, 1884	Louisville, Ky.....	Dec. 28, 1883
Buffalo, N. Y.....	Mar. 8, 1884	Lynchburg, Va.*.....	Apr. 4, 1885
Boston, Mass.....	July 30, 1884	Memphis, Tenn.....	Oct. 17, 1884
Burlington, Iowa.....	July 30, 1884	Milwaukee, Wis.....	Nov. 6, 1884
Baltimore, Md.....	Sept. 20, 1884	Montgomery, Ala.....	Nov. 19, 1884
Chattanooga, Tenn.....	Mar. 21, 1884	Nashville, Tenn.....	Dec. 28, 1883
Chicago, Ill.....	Dec. 26, 1883	New York City, N. Y.....	July 30, 1884
Cincinnati, Ohio.....	Dec. 28, 1883	New Haven, Conn.....	Nov. 6, 1884
Columbus, Ohio.....	July 23, 1884	New London, Conn.*.....	Apr. 4, 1885
Concordia, Kans.*.....	Apr. 4, 1885	New Orleans, La.....	Nov. 6, 1884
Cleveland, Ohio.....	Nov. 6, 1884	Norfolk, Va.*.....	Apr. 4, 1885
Cairo, Ill.....	Nov. 12, 1884	Omaha, Nebr.*.....	Apr. 4, 1885
Charlotte, N. C.....	Jan. 27, 1885	Philadelphia, Pa.....	July 30, 1884
Charleston, S. C.*.....	Apr. 4, 1885	Pittsburg, Pa.....	July 23, 1884
Des Moines, Iowa.....	July 30, 1884	Portland, Me.*.....	Apr. 4, 1885
Detroit, Mich.....	July 30, 1884	Rochester, N. Y.....	Nov. 6, 1884
Davenport, Iowa.....	Nov. 6, 1884	Springfield, Ill.....	July 23, 1884
Denver, Colo.*.....	Apr. 4, 1885	Saint Louis, Mo.....	Dec. 26, 1883
Dodge City, Kans.*.....	Apr. 4, 1885	Saint Paul, Minn.*.....	Apr. 4, 1885
Dubuque, Iowa*.....	Apr. 4, 1885	Shreveport, La.....	Nov. 19, 1884
Greencastle, Ind.....	July 23, 1884	Sandusky, Ohio*.....	Apr. 4, 1885
Galveston, Tex.....	Oct. 17, 1884	Savannah, Ga*.....	Apr. 4, 1885
Grand Haven, Mich*.....	Apr. 4, 1885	Toledo, Ohio.....	Nov. 6, 1884
Indianapolis, Ind.....	July 23, 1884	Vicksburg, Miss*.....	Apr. 4, 1885
Jacksonville, Fla.....	Nov. 6, 1884	Washington, D. C.....	July 30, 1884
Keokuk, Iowa.....	Nov. 6, 1884	Wilmington, N. C*.....	Apr. 4, 1885
Knoxville, Tenn*.....	Apr. 4, 1885		

\* To take effect on and after July 1, 1885.

The cold-wave signal is also displayed in the following cities:

Name.	Established.	Name.	Established.
Auburn, Ala.....	Sept. 20, 1884	Richmond, Va.....	June 6, 1885
Kansas City, Mo.....	Feb. 13, 1884	Westminster, Md.....	Sept. 18, 1884
Madison, Wis.....	Feb. 11, 1885		

I am, sir, very respectfully, your obedient servant,

F. M. M. BEALL,

Second Lieutenant, Signal Corps.

The CHIEF SIGNAL OFFICER OF THE ARMY,  
Washington, D. C.

## APPENDIX 55.

*REPORT UPON THE WEATHER AND TEMPERATURE SIGNALS.*

SIGNAL OFFICE, Washington, D. C., June 30, 1885.

SIR: I have the honor to make the following report upon the weather and temperature signals in use by this Service and State weather services:

The Chief Signal Officer being very frequently called upon by persons interested in weather and temperature changes, who have no means of obtaining the information, to furnish them the indications for the ensuing twenty-four hours, a plan has been adopted by which, through the co-operation of a number of railroads, the State weather services of Alabama and Ohio, and the citizens of certain towns, the indications of the weather and temperature for specific localities are given the public in the form of signals that are displayed on railway trains, at railway stations, and on flag-staffs erected in small towns.

The following is the list of weather and temperature signals adopted and in use by the Signal Service:



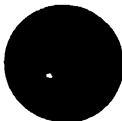
No. 1.—Large red sun, indicates "higher temperature" or warmer weather.



No. 2.—Red crescent, indicates "lower temperature" or colder weather.



No. 3.—Red star, indicates "stationary temperature."



No. 4.—Large blue sun, indicates "general rain (or snow)."



No. 5.—Blue crescent, indicates "clear or fair weather."



No. 6.—Blue star, indicates "local rain (or snow)."

These signals are used in two forms, the first being six flags, not less than 6 feet square, having the symbols in the center on white ground; and the second consisting of sheet-iron plates, about 3 feet in diameter, on which are painted the colors that denote the

signals. The flags are displayed from staffs erected at railway stations, in cities, small towns, &c., and the sheet-iron plates are attached to railway trains.

The system of signals above described is also in use by the Ohio State weather service.

The Alabama State weather service has adopted a different system of flag signals for use in that State, but the weather and temperature indications which these signals denote are almost identical with the Signal Service and Ohio State weather service system.

There are prepared at this office each night special forecasts of the weather for the succeeding twenty-four hours for the States of Alabama and Ohio, and for the regions traversed by railroads that have adopted this system of signals.

These special forecasts are telegraphed from this office to the directors of the Alabama and Ohio State weather services, to General J. F. Boyd, superintendent Cumberland Valley Railroad, to the superintendent of the Frederick division of the Pennsylvania Railroad, and others hereinafter mentioned.

The secretary of the New England Meteorological Society, at Cambridge, Mass., receives the indications from the Signal Service observer at Boston, Mass., to whom they are sent by this office.

Upon the receipt of the indications sent out by this office, the directors of the Alabama and Ohio State weather services and of the New England weather service immediately telegraph them to the superintendents of the various railway companies in their respective States that co-operate in the display of these signals.

The superintendents promptly distribute the information along their lines, and the signals which indicate the coming weather changes are displayed at an early hour, either at the railway stations or from railway trains.

Farmers, merchants, and the public generally along the lines of the railroads are informed by means of these signals as to the weather probabilities for the day, and they are thus enabled to take such precautions and to make such arrangements as the weather indications suggest are for their interest.

The superintendent of the Cumberland Valley Railroad and the superintendent of the Frederick division of the Pennsylvania Railroad receive the indications soon after midnight. The morning trains on these lines carry the proper symbols displayed on the baggage cars.

During the year this Service has endeavored to extend the system of weather and temperature signals, and all means that were available have been used to attain this result; but, owing to the fact that no appropriations have been made for the purpose, efforts in this direction have been greatly crippled, and this office has been unable to furnish the necessary signal flags to indicate probable weather conditions.

On May 14, 1885, 10,000 circulars were printed. A full description of each flag signal, with colored illustration, was given; also the price at which the full set of signals could be obtained, and the names and addresses of the manufacturers who would furnish them.

These circulars have been widely distributed among those who are interested in and receive benefit from weather predictions, and they have been informed that, as the weather indications are telegraphed daily to a large number of the stations of this service, to railroads, post-offices, &c., there are many small towns which could, by proper arrangement, obtain them by telephone or otherwise from the Signal Service stations, railroad stations, or post-offices receiving the reports and displaying the flags; also that the system is now in successful operation at various places, and could, by a little exertion and a small outlay for flags on the part of those who would be benefited, be extended indefinitely, and become one of the most valuable aids to the farmer, the merchant, and the public generally.

Correspondence has also been held with a number of railroad companies with a view to establishing this system on their lines.

It is gratifying to state that the efforts in this direction have met with considerable success, as will be shown in the following outline of what has been accomplished:

This system of signals has been adopted by the Florida Railroad and Navigation Company, and the disks showing the proper signals will be displayed from the baggage cars, beginning July 1, 1885. This company operates 540 miles of railroad and several steamers in Florida. The observer at Jacksonville will superintend the display of signals and take measures to have them properly understood. The special indications for Northern Florida are sent from this office at 1 a. m. daily.

The flag system of signals has been adopted by the Board of Trade of Albany, N. Y. The flags are displayed daily, from a staff on the signal office, and give the greatest satisfaction to the public.

The "Albany and New York day line of steamers" display the flag signals on their boats from Albany south to Poughkeepsie, and from New York City north to Poughkeepsie. The special 1 a. m. indications for Albany and vicinity and for New York and vicinity are furnished daily to this line of steamers by the observers at Albany and New York.

At Troy, N. Y., Messrs. E. W. Boughton & Co. display the flag signals at the expense of the firm. Special indications for Albany and vicinity are sent by telephone from the signal office at Albany.

In letter of June 8, 1885, Mr. W. A. Graham, of Fort Gaines, Ga., states that he will have no trouble in providing flags for display of signals at Fort Gaines if the indications are telegraphed daily. Mr. Graham was informed that as soon as he purchases the necessary flags the indications will be sent.

Mr. Frank Ross, at Oil City, Pa., states, in letter of June 5, 1885, that he can procure the funds to purchase flags for display at Oil City; and requests that the observer at Pittsburg be authorized to telegraph the indications daily for that section. He was told that this will be done when he reports that he has the flags.

At Meadville, Pa., the signals are displayed daily by Mr. J. W. H. Reisinger, postmaster. Special indications for Meadville, Pa., and vicinity are telegraphed from this office to Mr. Reisinger at 1 a. m. daily.

In letter of May 14, 1885, Mr. C. Selden, superintendent Baltimore and Ohio Telegraph Company, asks whether the Signal Service will furnish sets of weather and temperature signal flags for display at the principal points and important branch offices of the Baltimore and Ohio Railroad. If the service desires to do this, Mr. Selden thinks he can arrange with the president and general manager to have the signals displayed daily at such offices.

Mr. Selden was informed that this service has not the necessary funds from which to purchase flags, but they can be procured if the Baltimore and Ohio Railroad Company will co-operate by sending the telegrams and furnishing transportation for an observer to visit stations along the line of the road for the purpose of inducing the citizens to purchase the flags. Should this be done weather warnings will be made a special feature of the road, and special forecasts for each State will be made at this office.

Final arrangements have not yet been perfected.

The observer at Toledo, Ohio, in letter of May 28, 1885, states that the Toledo, Cincinnati and Saint Louis, and the Ohio Central Railroads will display the signals.

Special 1 a. m. indications for the vicinity of the Toledo, Cincinnati and Saint Louis Railroad, in Northern Ohio and Eastern Indiana, are telegraphed daily to Mr. N. McKinnon, superintendent of telegraph at Toledo.

Special 1 a. m. indications for the vicinity of this road in Central Illinois and Western Indiana are telegraphed daily to Mr. H. A. Boomer, division superintendent, Charleston, Ill.

Mr. McKinnon states that the messages will be sent to the towns along the road, and if this is not satisfactory, signals will be displayed on the trains.

The observer at Toledo also reports, in letter of June 24, 1885, that the officials of the Ann Arbor and Northern Michigan Railroad have promised to display the signals on their trains as soon as the road is completed to Mount Pleasant, Mich., which will be in a month or two.

The observer at Shreveport, La., in letter of June 20, 1885, states that the merchants are deeply interested in the subject of weather and temperature signals, and intend purchasing a set of flags for display on the signal office flag-staff.

The observer at Leavenworth, Kans., in letter of June 20, 1885, states that the display of signals on the Kansas Central Railway began June 20, 1885. The adoption of this system of signals by this road is due to the perseverance and energy of Dr. R. J. Brown, chairman of the meteorological committee of the Leavenworth Board of Trade, and to the efforts of the observer. Flags cannot be used to advantage, owing to the obstructions offered by two bridges, and the superintendent of the road has had an ornamental and well-arranged set of disks painted on white surfaces of steel, to be fixed in grooved slats placed on each side of the baggage-cars. Trains displaying these signals run between Leavenworth and Miltonville, a distance of 166 miles, and decided interest is manifested in them by the public.

Special indications for Kansas, Indian Territory, and Western Missouri are sent daily at 1 a. m. to the observer at Leavenworth, Kans.

The observer at Indianapolis, Ind., in letter of April 27, 1885, reports that Mr. Joseph W. Sherwood, superintendent Cincinnati, Indianapolis, Saint Louis and Chicago Railroad, desires to display signals on his trains as soon as arrangements can be made. The observer was informed as to the kind of signals to use, and directed to notify Mr. Sherwood that special predictions for the region of his road will be sent him if he adopts the system.

Weather and temperature signals are displayed daily at Bristol, R. I., and at Watertown, N. Y., by interested persons.

In letter of June 25, 1885, the observer at Toledo, Ohio, forwarded a communication from Mr. T. M. Peelar, superintendent Ohio Central Railroad, requesting that the 1 a. m. indications be sent him. Mr. Peelar was informed that a telegram designating the proper



flags to be displayed at stations on the Ohio Central Railroad will be sent him at Bucyrus, Ohio, at 1 a. m. daily. He was also sent circulars to be used in translating messages, if he desires only to bulletin the indications at stations on the line.

It is apparent that this method of announcing weather changes has been received with great favor by the public, and that the information given is of value to a large number of persons. This is abundantly shown by the hearty indorsement that the system has met with wherever it has been introduced.

It is hoped that these signals will, in the near future, be displayed in many towns where the residents have no means at present of obtaining information as to probable weather changes.

The simplicity and utility of the system cannot fail to commend it to every person who realizes the importance of a foreknowledge of the weather.

It is only necessary that the signal flags be purchased (the cost of the entire set ranging from \$16 to \$21) and that some public-spirited citizen devote a few minutes' time each day to displaying the proper signal, or signals, on a flag-staff in a prominent position near the center of the town. The indications for the locality can be sent from this office each day at a cost of 20 cents, or they can possibly be received from a neighboring Signal-Service station, or railway station, by telephone or telegraph. By these means an entire community can be benefited at a very small outlay.

The co-operation of a greater number of railroads is also desired, as it has been found that the display of these signals from railway trains and at railway stations has been productive of the best results.

The following is quoted from an interesting article on the Ohio meteorological bureau, written by Prof. T. C. Mendenhall, director of the Ohio State weather service, and published in the American Meteorological Journal, May, 1884:

"One of the most important undertakings of the bureau has been the establishment of a system of railway signals, by means of which people in the neighborhood of a railway line could be notified of the weather probabilities of the day in accordance with the predictions received from Washington. The first report issued by the bureau contained a reference to the proposed scheme, which had been suggested by Mr. M. R. Tracy, of Litchie, Ohio.

"In the spring of 1883 one of the railroads connecting Columbus with Cleveland (the Cleveland, Mount Vernon and Delaware Railroad) consented to undertake the experiment, offering to bear the expenses necessary in equipping the cars with the necessary signals. The subject of the most suitable system of signals received careful consideration. It was important that those selected should be at once simple, easily interpreted, and of such character as to be readily distinguished at a considerable distance. It was determined to confine the predictions, for the present at least, to forecasts of temperature and the state of the weather as to precipitation. Three forms were chosen, called by the familiar names sun, moon, and star. These are shown in two colors, red and blue. The red signals refer to temperature and the blue to rainfall. The sun, a round disk nearly 3 feet in diameter, is understood to mean a probable rise in temperature if red, or a general rain if blue. The moon, a crescent, means falling temperature if red, and clear or fair weather if blue. The star, five-pointed, means stationary temperature if red, and local rains if blue.

"Experience has shown that these signals are admirably adapted to the service to which they have been put, being easily distinguished from each other and instantly interpreted after a little practice.

"The Chief of the United States Signal Service, General Hazen, has generously co-operated with the bureau to secure the success of the experiment. Special telegrams have been sent, using the language of the signals, for the region of country traversed by the road. The trains bearing these signals on the baggage cars leave a point near the middle of the line about 5 o'clock a. m., thus bringing the forecast to the attention of residents along the line at an early hour. Verification observers have been appointed at nearly every station along the route, and thus far the predictions have been found correct in 85 cases in 100. The want of one or two additional signals has been felt for occasional use in forecasting extraordinary changes, such as extreme cold, violent winds, &c. The matter is receiving consideration, but no selection of such signals has been made. The Bureau has furnished models of these signals to several persons interested in this work who are making efforts to have them placed on roads in other States, and it is intended to extend the system in Ohio during the present year (1884)."

In connection with my report on this subject I have the honor to submit also the reports made by Prof. P. H. Mell, jr., director of the Alabama State weather service, Mr. E. H. Mark, secretary Ohio meteorological bureau, and Prof. William M. Davis, secretary New England Meteorological Society.

These reports are of special interest, as they indicate the importance attached to weather predictions in Alabama, Ohio, and New England, and also show the extent to

which the use of the weather and temperature signals has been carried in these sections through the generous co-operation of railway officials and others:

OHIO METEOROLOGICAL BUREAU,  
Columbus, Ohio, June 8, 1885.

DEAR SIR: In reply to yours of the 6th instant, I have the honor to inform you that the railway weather signals are displayed on the Cleveland, Mount Vernon and Delaware, both divisions of the Columbus, Hocking Valley and Toledo, and the Columbus and Cincinnati Midland Railroads. This bureau has charge of all the signals, and keeps a man employed at the Union Depot in Columbus to change the signals on all trains carrying them. The signals are also displayed on the morning trains coming into Columbus.

The predictions are received here in Columbus at about 1 a. m., and are immediately transmitted to the night operator at the telephone office, who transmits them to the telegraph offices at the depot. The night operator also transmits them to the train dispatcher of each of the roads, who immediately telegraphs them to the other end of the road, so that the morning train leaving for Columbus displays the signals. The signals are changed at these points by the baggage-master. On the Cleveland, Mount Vernon and Delaware the telegram containing the signals is sent to Akron, the central office of the road. The superintendent then issues an order to his trainmen in the same manner that all other train orders are issued.

The superintendent of the Cleveland, Mount Vernon and Delaware Railroad is N. Monarrat, Akron, Ohio. The superintendent of the Columbus, Hocking Valley and Toledo Railroad is G. R. Carr, Columbus, Ohio. The superintendent of the Columbus and Cincinnati Midland Railroad is S. P. Peabody, Columbus, Ohio. The first two named gentlemen have taken great interest in the work, and have done all they could to assist the bureau in carrying on the work.

The number of stations on the Columbus, Hocking Valley and Toledo is about one hundred; on the Cleveland, Mount Vernon and Delaware, thirty-seven; on the Columbus and Cincinnati Midland, thirty.

In addition to the above, many towns display the signals in prominent places, and quite an interest has been worked up in some places. Applications are received frequently from towns not lying on the railroads displaying the signals asking for the signals in their locality. Some of the agricultural societies of the State are anxious to take hold of the system, but the bureau is not able financially to extend the work.

Those sections receiving the signals place great reliance on the predictions as sent out by the Chief Signal Office. The large percentage of verification makes it a reliable source of information.

Hoping that the work may be greatly extended and ready to give any further information that you may desire,

I am, very respectfully, your obedient servant,

E. H. MARK, *Secretary*.

General W. B. HAZEN,  
*Chief Signal Officer, Washington, D. C.*

[State Agricultural and Mechanical College, Department of Natural History and Geology, and Central Office State Weather Service.]

AUBURN, ALA., June 18, 1885.

DEAR SIR: I have the honor to acknowledge the receipt of yours of the 6th instant, and send inclosed a list of the railroads displaying signals, their superintendents, the men having charge of the weather service on these various roads, and the stations at which these signals are displayed.

The superintendents of all the roads have taken the matter under their immediate charge, except the Mobile and Montgomery Railroad, the Mobile and Girard Railroad, and the Western Railroad of Alabama.

The weather service on the first two of these roads is under the direction of the chief telegraph railroad operators, while on the last-named road I authorize the operators at the stations to appropriate the message you furnish me each day, which they catch as it passes over the wires. This road has no wires of its own, and the Western Union Telegraph Company will not let the railroad authorities send these telegrams without charge.

The weather indications are received at this office between 6 and 7 o'clock, and are the indications issued from your office at 1 a. m.

The East Tennessee, Virginia and Georgia Railroad does not own its telegraph lines, and the only way to display signals along that road, I found, was to display them from the trains. The schedule on this road enables the signals to reach all parts of the road

before 3 p. m. I hope soon to have the signals displayed from the trains on the following roads, viz: The Alabama Great Southern Railroad, the Montgomery and Eufaula Railroad, the Memphis and Charleston Railroad, the Columbus and Western Railroad.

These roads do not own their telegraph lines, and hence the only way to reach the territory is by displaying the signals from the trains for the present.

The following are the railroads, with number of stations on each, that receive the weather signals daily:

Name of railroad.	Superintendents.	Number of stations.	Remarks.
Atlanta and West Point and Western of Alabama.	Cecil Gabbett, Montgomery, Ala.	12	The stations on this road are not furnished by the railroad superintendent, but directly from Auburn, Ala.
South and North.....	I. Y. Sage, Birmingham, Ala.....	9	Signals are furnished for these stations to Mr. W. Haylow, Montgomery, Ala.
Mobile and Montgomery..	M. S. Belknap, Montgomery, Ala.	8	
Mobile and Girard.....	W. L. Clarke, Columbus, Ga.....	5	Signals are furnished these stations through Mr. J. A. Roland, railroad telegraph operator, Columbus, Ga.
The Georgia Pacific .....	Levi Hege, Birmingham, Ala.....	11	
East Tennessee, Virginia and Georgia (Alabama Division).	J. M. Bridges, Selma, Ala.....	64	
North Eastern, of Georgia.	H. R. Bernard, Athens, Ga.....	8	

I am, very respectfully,

P. H. MELL, Jr.,  
Director Alabama Weather Service.

The CHIEF SIGNAL OFFICER, Washington, D. C.

NEW ENGLAND METEOROLOGICAL SOCIETY,  
CAMBRIDGE, MASS., July 9, 1885.

CHIEF SIGNAL OFFICER, UNITED STATES ARMY,  
Washington, D. C.:

SIR: In reply to your letter of the 6th ultimo, I have the honor to send, inclosed, a list of stations in New England, excepting Connecticut, displaying cold-wave and other weather signals.

The 1 a. m. indications are sent by mail from the Boston Signal Office to the following telephone exchanges:

Haverhill, Lowell, Salem, South Framingham, and Worcester, Mass.; also to G. S. Baas, assistant postmaster, Quincy, Mass. The morning mail reaches these points in time for an early display of flags.

The same indications are telegraphed from Signal Office in Boston to W. H. Childs, Brattleborough, Vt.; Telephone Exchange, Manchester, N. H., and from Signal Office in New Haven, Conn., to Telephone Exchange, Springfield, Mass.

It is from these centers that we hope to display flags and to extend the display to adjoining towns.

\* \* \* \* \*

Where the flags are displayed they are reported to give much satisfaction.

## Stations displaying weather flags in New Hampshire, Vermont, Massachusetts, and Rhode Island.

Station.	Number of flags displayed.	Indications used.	Display begun.	Indications furnished by—	Flags furnished by—	Displayed by—
Bedford, Mass.	Set of seven.	1 and 7 a. m.	Feb. —, 1885	Boston Telephone Exchange	Old Colony R. R.	Police Department.
Boston, Mass.	Cold wave.	1 a. m.	Jan. 20, 1885	Signal Office	W. H. Childs.	Old Colony R. R.
Brattleborough, Vt.	Set of seven.	Special	Feb. 12, 1885	Telephone from Boston signal office	Old Colony R. R.	W. H. Childs.
Brookton, Mass.	Cold wave.	1 and 7 a. m.	Jan. 20, 1885	Boston Telephone Exchange	T. Owen.	Old Colony R. R.
Clinton, Mass.	Set of seven.	1 a. m.	Feb. 26, 1885	Worcester Telephone Exchange	do.	do.
Cochituate, Mass.	do.	do.	Now ready	Framingham Telephone Exchange	Geo. C. Fairbanks.	Town clerk.
Dedham, Mass.	do.	1 and 7 a. m.	Mar. —, 1885	Worcester Telephone Exchange	H. H. McQuillan.	Cochituate Enterprise.
East Pepperell, Mass.	do.	Special	Jan. 20, 1885	Old Colony R. R.	G. G. Tarbell.	Police Department.
Fall River, Mass.	Cold wave.	1 a. m.	Mar. —, 1885	Fitchburg R. R.	G. G. Tarbell.	G. G. Tarbell.
Fitchburg, Mass. (a)	do.	do.	Now ready	Telephone from White River Junction, Vt.	W. W. Kimball.	Old Colony R. R.
Fitchburg, Mass. (b)	Set of seven.	do.	May 1885	Old Colony R. R.	Vickok & Frost.	J. W. Kimball.
Hanover, N. H.	do.	1 and 7 a. m.	Mar. —, 1885	Providence and Worcester R. R.	C. S. Cook.	C. S. Cook.
Leicester, Mass.	Cold wave.	1 a. m.	Apr. —, 1885	Manchester Telephone Exchange	P. N. Sprague	P. N. Sprague.
Leominster, Mass.	Set of seven.	7 a. m.	Feb. —, 1885	Old Colony R. R.	T. A. Hill.	J. B. Sargent.
Manchester, N. H. (a)	do.	do.	Feb. 4, 1885	Old Colony R. R.	A. Q. Gage	T. A. Hill.
Manchester, N. H. (b)	do.	do.	May —, 1885	Boston Telephone Exchange	McQuade Bros.	City Government.
Marlborough, Mass.	do.	1 and 7 a. m.	Mar. —, 1885	Old Colony R. R.	Pratt Bros.	McQuade Bros.
Medford, Mass.	Cold wave.	1 a. m.	Jan. 20, 1885	Old Colony R. R.	Old Colony R. R.	Police department.
Middleborough, Mass.	Set of seven.	Special	Feb. 18, 1885	Boston and Lowell R. R.	J. W. Crosby.	Old Colony R. R.
Milford, N. H.	do.	do.	June 1, 1885	Framingham Telephone Exchange	George C. Fairbanks.	J. W. Crosby.
Natick, Mass.	do.	do.	Jan. 20, 1885	Old Colony R. R.	do.	Old Colony R. R.
New Bedford, Mass.	Cold wave.	Special	Jan. 20, 1885	Boston Telephone Exchange	Improvement Association.	do.
Newport, R. I.	Set of seven.	1 and 7 a. m.	May —, 1885	Providence and Worcester R. R.	J. B. Harrison	J. B. Harrison.
Pawtucket, R. I. *	do.	1 a. m.	Jan. 20, 1885	Housatonic R. R.	Old Colony R. R.	H. F. Jenks.
Pittsfield, Mass.	do.	do.	Jan. 20, 1885	do.	do.	J. B. Harrison.
Plymouth, Mass.	Cold wave.	Special	Jan. 20, 1885	Boston Signal Office and Old Colony R. R.	G. S. Bass.	Old Colony R. R.
Quincy, Mass. (a)	do.	do.	Apr. 1, 1885	Old Colony R. R.	J. F. O'Brien.	do.
Quincy, Mass. (b)	Set of seven.	1 and 7 a. m.	Jan. 20, 1885	do.	do.	G. S. Bass.
Rock Bottom, Mass.	Cold wave.	1 a. m.	Mar. 1, 1885	Standard Time Company	Improvement Association.	J. F. O'Brien.
Somerset, Mass.	do.	Special	Mar. 1, 1885	Old Colony R. R.	do.	Old Colony R. R.
South Braintree, Mass.	do.	do.	Mar. 1, 1885	Boston Telephone Exchange	do.	do.
South Weymouth, Mass.	Set of seven.	1 and 7 a. m.	Feb. 17, 1885	do.	do.	H. A. Thomas.
Springfield, Mass. *	do.	1 a. m.	Mar. 6, 1885	Standard Time Company	Babbitt & Chapin	City of Taunton.
Taunton, Mass. (a)	do.	1 and 7 a. m.	Mar. 6, 1885	Old Colony R. R.	E. U. Jones	Chief of police.
Taunton, Mass. (b)	do.	do.	Jan. 20, 1885	do.	do.	do.
Taunton, Mass. (c)	Cold wave.	Special	Mar. 20, 1885	Boston Telephone Exchange	Bradford & Williams.	Bradford & Williams.
Waltham, Mass.	Set of seven.	1 and 7 a. m.	Mar. 18, 1885	do.	Subscription.	F. H. Walker.
West Medford, Mass.	do.	do.				

\* In preparation.

Very respectfully, your obedient servant,

W. M. DAVIS,  
*Secretary New England Meteorological Society.*

I am, sir, very respectfully, your obedient servant,

F. M. M. BEALL,  
*Second Lieutenant, Signal Corps.*

The CHIEF SIGNAL OFFICER OF THE ARMY,  
*Washington, D. C.*

## APPENDIX 56.

## REPORT ON RAILWAY WEATHER BULLETIN SERVICE.

SIGNAL OFFICE,  
Washington, D. C., June 30, 1885.

SIR: I have the honor to make the following report upon the work done by this service in connection with the Railway Weather Bulletin Service during the year ending June 30, 1885:

In arranging for railway bulletins of weather reports, the following points are observed:

This office causes the indications to be furnished at a fixed hour to any railway company volunteering to transmit them over their lines without charge to the United States.

The bulletins are displayed upon bulletin boards, having a heading as follows: "Daily weather report, Signal Service, United States Army. Published by co-operation of the \_\_\_\_\_ Railway Company and posted for the benefit of agriculture, commerce, and the traveling public."

Each station is supplied by this office with the following articles: One bulletin-board, one district map, one district map frame, Forms 125a (monthly report), Forms 126 (railway bulletins), franked envelopes.

The superintendents of the railway companies have the indications telegraphed to all the offices on their roads at as early an hour as practicable after they are open for business, and a copy of the indications, plainly written upon the "railway bulletin," is posted without delay upon the bulletin-board at each railway station.

The time of receiving and time of displaying the indications are noted by the operator on Form 125a, which form is forwarded to this office by mail at the end of each month by the operator or manager in charge of the telegraph office at which the indications are received, and a retained copy is kept for reference. Four of the bulletins displayed at the station are forwarded to this office by mail with Form 125a, one bulletin for each week included in the report.

Observers in charge of Signal Service stations from which the indications and weather reports are distributed give special attention to this portion of their duties. They see that the reports are furnished to the operator or designated agents of the companies immediately upon their receipt from this office.

They also confer with the officers of the railway companies at their stations and explain that the object of the railway bulletin service is to distribute the information collected at this office, and that the reports may prove of value to the railroads, the traveling public, and to citizens on the lines of the roads.

The railway bulletin system of weather reports is a most valuable adjunct of the Signal Service. Through the co-operation of the many railroad companies that have generously extended their aid without expense to the United States, the indications are daily posted at hundreds of towns, villages, and stations throughout the country, and thus thousands of persons are kept fully informed as to the conditions of the weather and the indications for the succeeding twenty-four hours. These small places on the lines of railroads have no newspapers, and many of them being at a great distance from the principal cities, the large number of people who are interested in and benefited by the weather reports have no means of obtaining the information except through the telegraph offices of the railway companies. It will be readily seen, therefore, that the farmers, fruit-growers, shippers of merchandise, lumbermen, and persons engaged in other industries who are dependent upon this system of publishing the weather reports are deeply interested in its support and extension.

The following extracts from the reports of the inspectors of the railway bulletin service indicate the importance attached to the work done by the Signal Service in this matter:

[From report of the inspection of the weather bulletins posted on the Cincinnati, Washington and Baltimore Railroad, by Sergt. L. Dunne, December, 1884.]

"With a few exceptions I found the indications for the day on which my visit was made, posted on the bulletin-boards. No bureau of the Government is more appreci-

ated than the Signal Service. Although my final instructions of November 25, 1884, did not mention post-offices, yet I made it a point to visit those displaying 'Farmers' Bulletins.' I found the bulletins were promptly posted. Postmasters say that hardly a person enters the office without consulting the bulletin. All speak in flattering terms of the great success attained in weather forecasts. The weather warnings are closely watched."

[From report of stations inspected on the Cleveland, Columbus, Cincinnati and Indianapolis Railroad, by Sergt. William Line, December 13, 1884.]

"The people along the various divisions take great interest in this work, and the indications are of great value to them, I am positive, for during the trip I had an opportunity to see the people and consult them."

[From report of stations inspected on the Flint and Pere Marquette Railroad, by Sergt. N. B. Conger, December 18, 1884.]

"I found the reports posted promptly. They were up to date, and are considered of great value by the railroad company and the citizens of the several towns where they are posted, and the service can be congratulated upon this evident display of interest in the weather reports."

[From report of stations inspected on the Chicago and West Michigan, and Grand Rapids and Indiana Railroads, by Sergt. J. E. Mueller, January 19, 1885.]

"The stations of Newaygo, Casnovia, Kent City, and Sparta Centre are all flourishing lumber towns, and near the southern terminus of the Newaygo branch of the Chicago and West Michigan Railroad; the country abounds in prosperous farms and fruit orchards, the owners of which are greatly interested in the daily bulletins, and derive considerable benefit from their regular display. The agent at Sparta Centre stated that on various occasions when, by accident or want of time, the indications were missed the people would promptly request him to call up the sending station and get them for their information. 'You see from that,' he continued, 'that it would not do here to neglect these reports, for they have taken too strong a foothold in this section of country.' The interest manifested in the reports is gratifying."

[From report of stations inspected on the Allegheny Valley, the Pittsburg, Fort Wayne and Chicago, and the Bellaire, Zanesville, and Cincinnati Railroads, by Sergt. O. D. Stewart, February 17, 1885. Number of stations inspected 117.]

"The general managers and superintendents of telegraph of each of the above-mentioned roads take great interest in these reports, and they not only desire but direct their agents and operators to copy the indications regularly, to give the public every facility to consult them, and to do all they can to aid in their promulgation. The railway bulletin is an important work of the service, as it reaches points too remote to be supplied in any other manner. My tour of inspection included portions of the States of Pennsylvania, Ohio, Indiana, and Illinois. I found the interest varied in different localities, depending largely upon the prevailing occupations of the people, but increasing in all localities. In Ohio a more general interest is manifested than in the other States mentioned. Many of the railroads running through that State carry the railway signals on sides of the baggage cars. These signals are regularly looked for and noted."

"All towns having a population of from 2,000 to 7,000 should receive the indications regularly, and especially have all the cold-wave orders telegraphed to them. In towns of this size there are enough persons sufficiently interested to bear, should it be necessary, the cost of transmitting the warnings."

[From report of stations inspected on the New York and New England Railroad, by Private J. P. Slaughter, February 27, 1885.]

"Much interest is manifested in predictions at nearly all stations. A large number of persons, both travelers and residents along the road, daily consult these bulletins, and are frequently much benefited by them."

During the year ending June 30, 1885, the railway weather bulletin service has been established on the following-named roads:

Name of railroad.	Number of stations posting the indications.	Name of railroad.	Number of stations posting the indications.
Bellaire, Zanesville and Cincinnati.....	9	South Carolina.....	10
Ohio River.....	9	Charleston and Savannah.....	6
Saint Louis and Cairo.....	12	Richmond and Alleghany.....	25
Washington, Ohio and Western.....	7	North-Eastern.....	5
Chicago and Alton.....	15	Saint Louis, Iron Mountain and South-ern.....	20
Cleveland, Lorain and Wheeling.....	7		

The stations posting the indications on the railroads mentioned in the following list have been inspected during the year:

Name of railroad.	Number of stations inspected.	Name of inspector.
New York Central and Hudson River.....	20	Sergt. J. O. Barnes.
Baltimore and Ohio.....	71	Sergt. Geo. W. Felger.
Boston and Lowell.....	13	Sergt. O. B. Cole.
Worcester, Nashua and Rochester.....	18	Do.
New York and New England.....	45	Private J. P. Slater.
Old Colony.....	108	Private O. N. Oswell.
Providence and Worcester.....	13	Sergt. O. B. Cole.
Burlington, Cedar Rapids and Northern.....	98	Sergt. F. F. Lyons.
Chicago and Northwestern.....	56	Sergt. T. B. Jennings.
Marletta and Cincinnati.....	14	Sergt. L. Dunne.
Cleveland, Columbus, Cincinnati and Indianapolis.....	33	Sergt. William Line.
Grand Rapids and Indiana.....	81	{ Sergt. J. E. Mueller.
		{ Private S. R. Kichey.
Chicago and West Michigan.....	40	{ Sergt. J. E. Mueller.
		{ Private S. R. Kichey.
Detroit, Grand Haven and Milwaukee.....	4	Sergt. N. B. Conger.
Flint and Pere Marquette.....	14	Do.
Detroit, Lansing and Northern.....	21	Do.
New York, Ontario and Western.....	81	Sergt. J. G. Linsley.
Southern Central.....	22	Do.
Allegheny Valley.....	39	Sergt. O. D. Stewart.
Pittsburg, Fort Wayne and Chicago.....	66	Do.
Bellaire, Zanesville and Cincinnati.....	13	Do.
Eastern.....	51	Sergt. G. Liebmann.
Grand Trunk (Yarmouth to Island Pond).....	14	Private B. A. Kinney.
Maine Central.....	11	Do.
Portland and Ogdensburg.....	12	Sergt. G. Liebmann.
Atchison, Topeka and Santa Fé.....	88	Private E. M. Philibaum.
Kansas City, Saint Joseph and Council Bluffs.....	45	Corpl. G. A. Weber.
Philadelphia, Wilmington and Baltimore.....	37	Sergt. C. N. Kitchel.
Philadelphia and Reading.....	119	Do.
Northern Central.....	4	Do.
Philadelphia and Erie.....	26	Do.
United Railroads of New Jersey.....	53	Do.
West Jersey.....	35	Do.
Baltimore and Potomac.....	4	Do.
Huntingdon and Broad Top Mountain.....	8	Do.
Cumberland Valley.....	10	Do.
Memphis and Charleston Division East Tennessee, Virginia and Georgia.....	7	Sergt. D. T. Flannery.
Pennsylvania.....	76	Sergt. C. N. Kitchel.

The total number of railway bulletin stations inspected during the year is 1,469.

In addition to those given in the above lists, the following railroads also post the weather bulletins: Boston and Maine, 34 stations; Lehigh Valley, 30 stations; Louisville and Nashville, 20 stations.

The stations on the above-named roads were not inspected this year.

The railway bulletin service was discontinued on the Chicago, Saint Paul, Minneapolis and Omaha Railway October 9, 1884, and on the Burlington, Cedar Rapids and Northern Railway February 25, 1885.

There are fifty-one railroads co-operating with the Signal Service in this important work, and the indications are posted at 1,555 stations along the lines of these roads.

Assuming that upon an average there are twenty-five persons at each of these railway stations who are directly interested in the weather indications, it will be seen that at the total of 1,555 stations there are 38,875 people who are daily benefited by this system of weather reports.

I am, sir, very respectfully, your obedient servant,

F. M. M. BEALL,  
Second Lieutenant, Signal Corps.

The CHIEF SIGNAL OFFICER OF THE ARMY,  
Washington, D. C.



## APPENDIX 57.

## REPORT ON RIVER AND FLOOD WARNINGS.

SIGNAL OFFICE,  
*Washington City, June 30, 1885.*

SIR: I have the honor to state that the river and flood reports from regular Signal Service and special river stations have been continued throughout the year ending June 30, 1885, as in previous years.

The river system of the United States embraces some of the largest navigable rivers of the world, and the area of country drained by them includes great and fertile tracts of agricultural and mineral lands.

The enormous products of the soil and mines have so stimulated the river commerce that millions of dollars are invested in levees, wharves, dams, shipping, &c.

The frequent disasters to these investments by storms and floods, and the destruction of property resulting from the sudden and unforecast rises of the rivers, have created a demand for such information as can be used to assist the property owners and the public generally in anticipating the future rise of the rivers to the danger line.

In the absence of storms and floods the interests of the river commerce also demand a knowledge of the water supply in the tributaries of our great rivers, to permit a determination of the future supply of water for purposes of navigation at points where the depth is sometimes insufficient. River observations will indicate the slightest increase or decrease of water in the river caused by recent rains, melting of snow, or drought.

The rise or fall of the water at any point will, as a rule, cause a rise or fall farther down the river. To warn those interested who are located below, the observations are immediately telegraphed down the river to such points as experience has shown are most desirable for the warning of river interests.

At points where meteorological stations of the Signal Service are located, the observers of such stations are charged with taking the river observations. At other points where river observations are desired the observers are selected from the citizens at those points.

The duties required of the special river observers consist of taking and recording observations at stated hours of (1) the depth of the water in the river; (2) the state or condition of the weather; (3) the direction of wind; (4) the amount of rain or snowfall since the last observation; (5) the depth of the snow on the ground. These phenomena, if ordered sent by telegraph, are reduced to a brief cipher telegram, as hereinafter described, and delivered to the local telegraph office for transmission to such points as may be directed by the Chief Signal Officer. If ordered sent by mail, they are not enciphered, but entered on the postal cards or other form furnished the river observer, according to the printed headings thereon, and mailed to their destination.

The data collected in making these observations being for the benefit of the public, special river observers are authorized to furnish such data to any one needing the information.

This branch of the service has been largely increased, and a much greater area of country, affected by the changes in our larger rivers, has been covered. The resulting value of the information furnished business interests has been very great.

On January 1, 1885, the special river stations were arranged in sections and placed in charge of the Signal Service observers at section centers.

With a few exceptions, special river observers receive all instructions from, or through, and render all reports and bills to, the section centers. Observers in charge of section centers receive, examine, and certify to the correctness of all reports and bills from special stations, and then forward them to this office.

If reports or bills are not received at the section centers within three days after the period at which they are due, they are called for by mail. Any persistent neglect of the special stations in this direction is reported to the Chief Signal Officer with such recommendation as the observer may consider proper to make to improve the service. Defective reports which cannot be remedied at section centers are sent back to the special stations for correction. Section centers make a report to the Chief Signal Officer, on the 15th day of each month, of the reports which are missing for the previous month, giving the probable reason therefor.

In certifying to bills, care is exercised to see that the time for which charge is made is correct, the vouchers properly signed, &c. Bills are not certified to until the reports which they cover are received and acted upon. Each bill bears the following certificate on its face, signed by the observer in charge of the section center: "The account is correct and just, and the services have been rendered as stated."

Bills are rendered on Form 9 (old Form 62a) and filled out as follows:

"For services rendered as river observer, at —, for the month of —, 188—, for — (give the number of observations), at — cents per day (or observation)."

When an observation or report has been missed or extra ones are taken the fact is noted on the face of the bill, for example: "No observations taken August 2 and 7." The bill is altered to agree with work done.

Observers in charge of section centers are held responsible for the correctness of all bills certified to by them, and they assure themselves of their accuracy before forwarding them to this office. In no case are reports or bills held at section centers longer than is absolutely necessary to act upon them.

In corresponding with special stations, the observers in charge of section centers exercise proper official courtesy and keep a careful record of the correspondence.

The number of observations to be taken daily is determined by the Chief Signal Officer, or by the observers in charge of centers.

The centers are usually located at some important city where the reports of the special stations in the vicinity can be most advantageously collected and published for the benefit of the river commerce.

On November 19, 1884, instructions were issued in pamphlet form for the guidance of river observers in erecting gauges, taking observations, rendering reports, &c.; also a complete cipher for enciphering reports for telegraphic transmission. These instructions cover the entire field of special river observations. They went into effect on the Tennessee River system December 1, 1884, and at all other special river stations January 1, 1885.

On January 1, 1885, the measurement of the depth of water was changed from feet and inches to feet and tenths of a foot, and all measurements have since been so read, recorded, and published.

Regular river observations are made at 2 p. m., seventy-fifth meridian time, daily; but when a rise in the river is sudden or dangerous, or when special reports are called for by the observer in charge of the section center, as many extra observations are taken as are deemed necessary to keep the public fully informed of the nature and extent of the rise.

Form No. 203 is used for enciphering observations. The form properly filled up is delivered at the telegraph office as soon as possible after taking the observations, and the report is immediately telegraphed to the observer in charge of the center. Upon receipt of the reports from the stations in his center the observer in charge transfers his reports from all stations to Form No. 108 (daily report of stage of water in the twenty-four hours ending at 2 p. m., seventy-fifth meridian time). This form gives the following data: Names of stations making reports; height of river above low water; change in twenty-four hours; direction of wind and state of weather at time of report. Copies of this form are posted in conspicuous places so that they are readily accessible to the public. The information is also published in the daily newspapers. By these means all interests are kept fully informed of the condition of the rivers, and are thus enabled to take the necessary precautions for protecting property.

In cases of sudden and dangerous rises, and of floods, the information which is given promptly during the period of danger is of incalculable benefit to rivermen, vessel-owners, shippers of merchandise, &c., and is doubtless often instrumental in saving lives.

Whenever necessary, reports from adjoining stations are ordered sent to observers at special river stations, and are given by them to the press, and also posted in such public places as are most frequented by persons interested in the condition of the river.

All observations taken during the month are recorded on Form No. 114. One copy of this form is retained at the station, and two copies are sent to the observer in charge of the section center.

The observer at Chattanooga, Tenn., in his report upon the operation of the Tennessee flood system during April, 1885, states:

"There is a growing opinion of the value of the system, both in this community and in places lower down the river supplied with daily bulletins from this center. The lumbermen have been so greatly benefited by the reports, that they are anxious to obtain like information of sudden rises, calculated to bring down timber during other months, and a memorial to this effect is being prepared by them, which will be forwarded."

The observer at Nashville, Tenn., in a report dated March 9, 1885, commenting upon a sudden rise in the Cumberland River, states: "Reckoning in money value all property saved during the rise mentioned, it would more than sustain this river-center for

two centuries to come. Also: "The steamboatmen have caused a large bulletin-board, 4 by 6 feet, to be made, at great expense to themselves, whereon is shown daily the river data."

Reports of Western floods were telegraphed during the present season, by special message, to the observer at New Orleans, La., to be by him distributed to the following addresses by messenger, whenever practicable, and to outlying places by telegraph: The Capitolian Advocate, Baton Rouge, La.; W. T. Evans, Vidalia, La.; Thomas Moore, Saint Joseph, La.; M. C. Redmond, Floyd, La.; A. W. Crandall, Tallulah, La.; T. J. Manghan, Rayville, La.; E. M. Coe, Monroe, La.; A. C. McMeans, Bastrop, La.; F. H. G. Taylor, Lake Providence, La.; — Floyd, postmaster, Delta, La.; L. M. Howard, Coushatta, La.; L. C. Giffe, Alexandria, La.; Louisiana Farmer, New Iberia, La.; Dr. J. P. H. Wise, Morgan City, La.; Maj. S. T. Grisamore, editor Thibodeaux Sentinel, Thibodeaux, La.; Sugar Planters' Association, Donaldsonville, La.; Vicksburg Herald, Vicksburg, Miss.; Natchez Democrat, Natchez, Miss.; Dr. Trezevant, Delta, La.; B. Myrick, Girard, La.; Hon. R. C. McCullough, Waterproof, La.; New Orleans Picayune, New Orleans, La.; New Orleans Times-Democrat, New Orleans, La.; The States, New Orleans, La.; New Orleans Daily City Item, New Orleans, La.; New Orleans Bee, New Orleans, La.; The German Gazette, New Orleans, La.; Cotton Exchange, New Orleans, La.; Produce Exchange, New Orleans, La.; Sugar Exchange, New Orleans, La.; Maritime Association, New Orleans, La.; Major Richardson, Chief of State Board of Engineers, New Orleans, La.; W. M. Davidson, Saint Joseph, La.; V. M. Purdy, Lake Providence, La.; Dr. S. S. P. Dangerfield, Delta, La.

The pay of the special river observers is at the rate of 25 cents per observation made, recorded, enciphered, and delivered at the telegraph office. When three or more observations are made in any one day, the pay is at the rate of 75 cents per day.

The following are special rates of pay authorized by this office:

The observer at Eugene City, Oreg., receives 50 cents per observation, or \$1.50 per day when more than three observations are taken in one day. The observer at Harper's Ferry, W. Va., receives 50 cents per observation. The observers at Helena, Ark., and Kansas City, Mo., receive 50 cents per day each. The observer at Muscatine, Iowa, renders his services gratuitously.

The following stations have been discontinued during the year:

Jefferson City, Mo. (Saint Louis Center), March 15, 1885; Lexington, Mo. (Saint Louis Center), March 15, 1885.

The following stations have been established during the year:

Stations.	When established.	Stations.	When established.
Brookville, Pa. (Pittsburg Center).....	Nov. 19, 1884	Coushatta Chute, La. (Shreveport Center).....	Jan. 15, 1885
Clarion, Pa. (Pittsburg Center).....	Nov. 19, 1884	Girard, La. (New Orleans Center).....	Jan. 30, 1885
Johnstown, Pa. (Pittsburg Center).....	Nov. 19, 1884	Delhi, La. (New Orleans Center).....	Jan. 30, 1885
Morgantown, W. Va. (Pittsburg Center).....	Nov. 19, 1884	Beardstown, Ill. (Saint Louis Center).....	Mar. 7, 1885
Parker's Landing, Pa. (Pittsburg Center).....	Nov. 19, 1884	Jerome, Mo. (Saint Louis Center).....	Mar. 7, 1885
Rowlesburg, W. Va. (Pittsburg Center).....	Nov. 19, 1884	Prescott, Wis. (La Crosse Center).....	Mar. 7, 1885
Warren, Pa. (Pittsburg Center).....	Nov. 19, 1884	Wabasha, Minn. (La Crosse Center).....	Mar. 7, 1885
Weston, W. Va. (Pittsburg Center).....	Nov. 19, 1884	Louisiana, Mo. (Saint Louis Center).....	Mar. 7, 1885
Burnside, Ky. (Nashville Center).....	Dec. 1, 1884	Arkansas City, Ark. (Vicksburg Center).....	May 11, 1885
Carthage, Tenn. (Nashville Center).....	Dec. 1, 1884	Bayou Sara, La. (New Orleans Center).....	May 11, 1885
Alexandria, La. (New Orleans Center).....	Jan. 10, 1885	Newport, Ark. (Vicksburg Center).....	May 11, 1885
Fulton, Ark. (Shreveport Center).....	Jan. 10, 1885	Yazoo City, Miss. (Vicksburg Center).....	May 11, 1885
Grand Tower, Ill. (Cairo Center).....	Jan. 15, 1885		

The special river station at Monroe, La., was transferred from the Washington City Center to the New Orleans Center January 30, 1885.

On June 12, 1885, special river stations were ordered to be established at Camden, Ark., and West Melville, La., under New Orleans Center, to date July 1, 1885.

On June 17, 1885, a special river station was ordered to be established at Mount Holly, N. C., under Charleston, S. C., Center, to take effect July 1, 1885.

By special request of the merchants and river captains along the Cumberland River, the special river observations at Burnside, Ky., under Nashville Center, were continued until June 30, 1885.

The following list gives the special river stations now in operation; also the period during which observations are taken, the center to which reports are made, etc.:

Albany, Oreg. (November 15 to December 15, and February 15 to May 1).—Takes ob.

servations daily, and, when the river approaches the danger line, telegraphs reports to Portland, Oreg., consolidated with those of Eugene City, when the latter has been received.

*Alexandria, La.* (all the year).—Takes observations daily, at 2 p. m., and telegraphs them to Observer, New Orleans, who is also authorized to call for special telegraphic reports. Telegraphs in case of a dangerous rise.

*Beardstown, Ill.* (all the year).—Takes observations daily, and, when dangerous rise occurs, or when special telegraphic reports are called for, telegraphs them to Saint Louis.

*Boonville, Mo.* (all the year).—Takes observations daily, and, in case of dangerous rise, or when special reports are called for, telegraphs to Saint Louis. Also telegraphs to Saint Louis in case of ice-dams, lumber obstructions, and closing of navigation.

*Brookville, Pa.* (all the year).—Takes observations daily, at 7 a. m. and 2 p. m., and telegraphs them to Pittsburg in case of dangerous rise; or when special reports are called for, telegraphs them to Pittsburg.

*Brownsville, Pa.* (all the year).—Takes observations daily, at 7 a. m. and 2 p. m. and telegraphs them to Pittsburg in case of dangerous rise; or when called for, telegraphs special reports to Pittsburg.

*Brunswick, Mo.* (all the year).—Takes observations daily at 2 p. m. Telegraphs to Saint Louis in case of a dangerous rise and also telegraphs to Saint Louis when special reports are called for by the observer, and in case of ice dams or other obstructions in the river, and the opening and closing of navigation.

*Burnside, Ky.* (December to April, both inclusive).—Takes observations daily at 2 p. m. and transmits them by postal-card to Nashville. When river rises 6 feet or more during twenty-four hours, or rainfall equals or exceeds 2 inches the 2 p. m. observation is telegraphed to Nashville; also in case of dangerous rise or when called for by observer, Nashville, telegraphs him special reports at 8 a. m. and 8 p. m. Special reports are also made to Nashville of the formation or breaking up of ice in the river and of the opening and closing of navigation.

*Carthage, Tenn.* (December to April, both inclusive).—Takes observations daily at 2 p. m. and transmits by postal-card to Nashville. When river rises 5 feet or more during past twenty-four hours, or rainfall equals or exceeds 2 inches the 2 p. m. observation is telegraphed to Nashville; also in case of dangerous rise or when called for by observer, Nashville, special reports are made and telegraphed at 8 a. m. and 8 p. m. Special telegraphic reports are made on breaking up of ice, formation of obstructions, and opening and closing of navigation.

*Charleston, Tenn.* (December to March, both inclusive).—Takes observations daily at 2 p. m. and transmits by postal-card to Chattanooga. In case of dangerous rise, or when special reports are called for, they are made at 8 a. m. and 8 p. m. and telegraphed to Chattanooga.

*Clarion, Pa.* (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and transmits by telegraph to Pittsburg. In case of dangerous rise, or when called for, special reports are made to Pittsburg by telegraph.

*Clinton, Tenn.* (December to March, both inclusive).—Takes observations daily at 2 p. m., and transmits by postal card to Chattanooga. In case of dangerous rise, or when called for, special observations are made at 8 a. m. and 8 p. m., and telegraphed to Chattanooga.

*Colusa, Cal.* (December 15 to May 1).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs special observations to Sacramento (consolidated with report from Red Bluff, if received).

*Confluence, Pa.* (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and transmits by telegraph to Pittsburg. In case of dangerous rise, or when called for, telegraphs special reports to Pittsburg.

*Coushatta Chute, La.* (all the year).—Takes observations daily at 2 p. m. and transmits by telegraph to Shreveport. In case of dangerous rise, or when called for, telegraphs special reports to Shreveport.

*Decatur, Ala.* (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to "Signals, Washington."

*Delhi, La.* (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, or when called for, special reports are telegraphed to New Orleans.

*Eugene City, Oreg.* (November 15 to December 15 and February 15 to May 1).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to Portland, Oreg.

*Evansville, Ind.* (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to "Signals, Washington."

*Freeport, Pa.* (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and transmits by telegraph to Pittsburg. In case of dangerous rise, or when called for, telegraphs special reports to Pittsburg.

*Folsom City, Cal.* (December 15 to May 1).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs special reports to Sacramento.

*Fulton, Ark.* (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to Shreveport.

*Grand Tower, Ill.* (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, or when special reports are called for, telegraphs to Cairo.

*Girard, La.* (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, or when special reports are called for, telegraphs to New Orleans.

*Harper's Ferry, W. Va.* (—).—Takes observations in case of a sudden rise, &c., and telegraphs them to "Signals, Washington."

*Helena, Ark.* (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, special observations are telegraphed to Vicksburg and "Signals, Washington."

*Hermann, Mo.* (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs reports to Saint Louis and "Signals, Washington."

*Jerome, Mo.* (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs reports to Saint Louis.

*Johnstown, Pa.* (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and telegraphs to Pittsburg. In case of dangerous rise, or when called for, telegraphs special reports to Pittsburg.

*Johnsonville, Tenn.* (all the year).—Takes observations daily at 2 p. m., and in case of dangerous rise, telegraphs to "Signals, Washington."

*Kanawha City, Mo.* (all the year).—Takes observations daily at 2 p. m., and in case of dangerous rise, telegraphs to Saint Louis and "Signals, Washington."

*Kingsport, Tenn.* (December to March, both inclusive).—Takes observations daily at 2 p. m., and transmits by postal-card to Chattanooga. In case of dangerous rise, or when called for, special reports are made at 8 a. m. and 8 p. m., and telegraphed to Chattanooga.

*Leadvale, Tenn.* (December to March, both inclusive).—Takes observations daily at 2 p. m., and transmits by postal-card to Chattanooga. In case of dangerous rise, or when called for, special reports are made at 8 a. m. and 8 p. m., and telegraphed to Chattanooga.

*Le Claire, Iowa* (all the year).—Takes observations daily at 2 p. m., and in case of dangerous rise, telegraphs to "Signals, Washington."

*Louisiana, Mo.* (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to Saint Louis.

*Loudon, Tenn.* (December to March, both inclusive).—Takes observations daily at 2 p. m., and transmits by postal-card to Chattanooga. In case of dangerous rise, or when called for, special reports are made at 8 a. m. and 8 p. m., and telegraphed to Chattanooga.

*Mahoning, Pa.* (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and transmits by telegraph to Pittsburg. In case of dangerous rise, or when special reports are called for, telegraphs to Pittsburg.

*Marietta, Ohio* (all the year).—Takes observations daily at 2 p. m. In case of a dangerous rise, or when called for, telegraphs to "Signals, Washington."

*Marysville, Cal.* (December 15 to May 1).—Takes observations daily at 2 p. m. In case of a dangerous rise, special reports, consolidated with special reports from Oroville, are telegraphed to Sacramento.

*Monroe, La.* (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, or when special reports are called for, telegraphs to New Orleans.

*Morgantown, W. Va.*, (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and transmits by telegraph to Pittsburg. In case of dangerous rise, or when special reports are called for, telegraphs to Pittsburg.

*Mount Carmel, Ill.* (all the year).—Takes observations daily at 2 p. m.; in case of dangerous rise, telegraphs to postmaster Shawneetown, Ill.

*Muscatine, Iowa* (all the year).—Takes observations daily at 2 p. m.

*New Geneva, Pa.* (all the year).—Takes observations at 7 a. m. and 2 p. m. daily, and transmits by telegraph to Pittsburg. In case of dangerous rise, or when special reports are called for, telegraphs to Pittsburg.

*Oil City, Pa.* (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and telegraphs to Pittsburg. In case of dangerous rise, or when special reports are called for, telegraphs to Pittsburg.

*Oroville, Cal.* (December 15 to May 1).—Takes observations daily at 2 p. m. In case of dangerous rise, special observations are telegraphed to observer, Marysville, Cal.

*Parker's Landing, Pa.* (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and transmits by telegraph to Pittsburg. In case of dangerous rise, or when special reports are called for, telegraphs to Pittsburg.

*Paducah, Ky.* (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to "Signals, Washington."

*Peoria, Ill.* (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to Saint Louis and "Signals, Washington."

*Plattsmouth, Nebr.* (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to "Signals, Washington."

*Prescott, Wis.* (all the year).—Takes observations daily at 2 p. m., and in case of dangerous rise, telegraphs to La Crosse.

*Rockwood, Tenn.* (December to March, both inclusive).—Takes observations daily at 2 p. m., and transmits by postal-card to Chattanooga. In case of dangerous rise, or when called for, special observations are made at 8 a. m. and 8 p. m., and telegraphed to Chattanooga.

*Rowlesburg, W. Va.* (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and transmits by telegraph to Pittsburg. In case of dangerous rise, or when special reports are called for, telegraphs to Pittsburg.

*Saint Joseph, Mo.* (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, special reports are telegraphed to "Signals, Washington."

*Salisbury, Pa.* (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and transmits by telegraph to Pittsburg. In case of dangerous rise, or when special reports are called for, telegraphs to Pittsburg.

*Strauberry Plains, Tenn.* (December to March, both inclusive).—Takes observations daily at 2 p. m., and transmits by postal-card to Chattanooga. In case of dangerous rise, or when special reports are called for, special observations are made at 8 a. m. and 8 p. m., and telegraphed to Chattanooga.

*Umatilla, Oreg.* (November 15 to December 15 and February 15 to July 1).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to Portland, Oreg.

*Wabasha, Minn.* (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to La Crosse.

*Warsaw, Ill.* (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to Saint Louis and "Signals, Washington."

*Warren, Pa.* (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and transmits by telegraph to Pittsburg. In case of dangerous rise, or when special reports are called for, telegraphs to Pittsburg.

*Weston, W. Va.* (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and transmits by telegraph to Pittsburg. In case of dangerous rise, or when special reports are called for, telegraphs to Pittsburg.

*Wheeling, W. Va.* (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, or when called for, special reports are telegraphed to "Signals, Washington."

The following is a list of stations that have not yet gone into operation: Arkansas City, Ark. (Vicksburg center); Bayou Sara, La. (New Orleans center); Newport, Ark. (Vicksburg center); Yazoo City, Miss. (Vicksburg center); Camden, Ark. (New Orleans center); West Melville, La. (New Orleans center); Mount Holly, N. C. (Charleston center).

Orders have been issued for the establishment of the stations in the above list, and as soon as river-gauges are erected and observers appointed the observations will commence.

I am, sir, very respectfully, your obedient servant,

F. M. M. BEALL,  
Second Lieutenant, Signal Corps.

The CHIEF SIGNAL OFFICER OF THE ARMY.

## APPENDIX 58.

## REPORT ON THE COTTON-REGION SYSTEM.

SIGNAL OFFICE, WAR DEPARTMENT,  
Washington City, June 30, 1885.

SIR: I have now the honor to submit my report of the work done in stations division in connection with the system of cotton-region reports, for the year ending June 30, 1885.

This system was inaugurated in September, 1881, upon the earnest request of citizens interested in the cultivation of cotton. By the co-operation of the railway and telegraph officials where stations are located, it has been thoroughly organized and the reports are considered of inestimable value to the planters in the cotton region, and to cotton interests throughout the country.

The reports of rainfall and maximum and minimum temperatures are promptly distributed from the district centers, and all the leading cities of the South are supplied daily with the information they furnish; they are also published in the newspapers and bulletined at cotton exchanges and other prominent places, where they are readily accessible to business men and the general public.

The work when begun in 1881 was necessarily rather limited in extent, but it has since been greatly extended and systematized, so that it is now one of the most valuable features of the Signal Service. It is gratifying to state that the efforts made in this direction are fully appreciated by those in whose interest the system was established.

The reports are collected and disseminated throughout the commercial centers of the cotton region from April 1 to October 31 of each year; this year, however, owing to the small balance of the appropriation available for the purpose, the observations at the various stations were not commenced until May 1. Many protests were made by the cotton exchanges and the classes mostly interested in cotton, but it was found necessary either to take this action or close a large number of stations. It was thought best for all interests that the full number of stations be maintained, in consequence of which observations could not be commenced until May 1.

Observations of maximum and minimum temperatures and rainfall are taken simultaneously at all stations in the cotton region at 6 p. m., seventy-fifth meridian time. The manner of taking observations, telegraphing reports, and collecting and distributing the information at the centers has been continued as described in detail in my report for the year ending June 30, 1884.

The following is a description of the forms used in connection with this work:

Form 138 is a manifold bulletin showing the average maximum and minimum temperatures and rainfall for the several districts, for the past twenty-four hours, and is posted daily at each center, in prominent places most convenient to persons interested.

Form 138b is also a manifold bulletin and is used by the centers to show the maximum and minimum temperatures and rainfall at each station in their respective districts.

Form 144 is used by each cotton-region station to record the maximum and minimum temperatures, rainfall, time of taking observation and time of filing the report for transmission. The form is mailed to the district center at the end of each month, where it is critically examined and afterward forwarded to this office for use in the preparation of meteorological data.

Form 203 (card) is used by the observers at substations in enciphering the observations and, after the report has been transmitted by telegraph, it is retained and filed as part of the station records.

Form 150 (card) "Condition of Instruments," is used once each month by each station to report the condition of the meteorological instruments to the district center.

Form 144b is used to report the total amount of rainfall daily and weekly, at regular stations of the Signal Service in the cotton region. It is prepared at this office from the regular 7 a. m., 3 p. m., and 11 p. m. reports, and is mailed to observers and others on Saturday of each week. The information is furnished in the interest of cotton exchanges, merchants, and cotton planters. The form is sent to the Signal Service observers at Atlanta, Augusta, Baltimore, Charleston, Cincinnati, Galveston, Indianola, Jacksonville, Knoxville, Little Rock, Louisville, Lynchburg, Memphis, Mobile, Montgomery, Nashville, New Orleans, New York, Norfolk, Pensacola, Savannah, Shreveport, Vicksburg,

and Wilmington; also to the Board of Trade, Savannah, Ga., Commercial Bulletin, Boston, Mass., Mr. J. F. Wheless, Cotton Exchange, Nashville, Tenn., Mr. C. W. Simmons, secretary and treasurer, Cotton Exchange, Saint Louis, Mo., and the Secretary National Board of Health, Washington, D. C.

Each cotton-region station is supplied with the following: One instrument shelter; one maximum thermometer; one minimum thermometer; one rain-gauge and measuring stick; supply of official cards (forms 150 and 203) and forms 144.

Observations were continued during July, August, September, and October, 1884. They were discontinued October 31, 1884, and resumed May 1, 1885.

The various cotton-region stations are arranged in sections as follows:

Each section is under the observer in charge of a regular station of the Signal Service, which station is known as the "section center." When practicable the name of the section center is used to designate the section.

Cotton-region stations receive all instructions from or through and render all reports and bills to the section centers. Observers in charge of section centers receive, examine, and certify to the correctness of all reports and bills from special stations and then forward them to this office.

If reports or bills are not received at the section centers within three days after the date on which they are due, they are called for by mail. Any persistent neglect of the special stations in this direction is reported to the Chief Signal Officer with such recommendation as the observer may consider proper to make to improve the service. Defective reports which cannot be remedied at section centers are returned for correction. Section centers make a report to the Chief Signal Officer on the fifteenth day of each month of the reports which are missing for the previous month, giving the probable reason therefor.

In certifying to bills, great care is exercised to see that the time for which charge is made is correct, the vouchers properly signed, &c. Bills are not certified to until the reports which they cover are received and acted upon. Each bill bears the following certificate on its face, signed by the observer in charge of the section center: "The account is correct and just, and the services have been rendered as stated."

Bills are rendered on Form 9 (old Form 62a), and filled out as follows:

"For services as —, at —, for the month of —, 188—, for — (give the number of reports), at — cents per report."

When an observation or report has been missed, the fact is noted on the face of the bill, for example, "No observations taken August 2 and 7." The bill is altered to agree with the work done.

Observers in charge of section centers are held responsible for the correctness of all bills certified to by them, and they are required to assure themselves of their accuracy before forwarding to this office.

The pay of the civilian observers continues at 20 cents per report made. The operators employed at centers, &c., collecting reports for concentration receive 5 cents per report.

Messengers are employed collecting reports from railroad offices at centers, &c., at the following places:

Houston, Tex., \$5 per month; New Orleans, La., \$15 per month; Selma, Ala., \$5 per month. Mr. J. H. McHugh, operator at New Orleans, is paid \$6 per month, by special authority, for receiving reports from Amite City, La., Brookhaven, Miss., and Hazlehurst, Miss. An operator is employed, by special authority, at Houston, Tex., to transfer reports to Galveston center, from six substations, at 5 cents per report.

The cotton-region station at Hempstead, Tex., under Galveston center, was discontinued March 14, 1885. The station at Whiteville, La., under New Orleans center, was discontinued June 10, 1885.

A cotton-region station was established at Port Gibson, Miss., under New Orleans center, June 10, 1885.

The committee on information and statistics, New Orleans Cotton Exchange, being desirous of obtaining complete data from all substations, requested that the observers be directed to send their retained Forms 144 to the New Orleans center for making out a monthly report. As it was not considered advisable to send the Forms 144, the observer in charge of each cotton-region center was instructed, March 20, 1885, to mail daily a copy of Form 138 to the New Orleans center.

Our observer at Shreveport, La., in letter of February 19, 1885, states that great interest is manifested in the Signal Service reports, and suggests that Shreveport be made a cotton-region center. He was told that the appropriation was not sufficient to admit of establishing new stations and making Shreveport a center. The observers at Galveston, Little Rock, and New Orleans were directed, on March 6, 1885, to mail daily to observer, Shreveport, a copy of Form 138b, containing reports from the stations in their districts.



Cotton-region stations have been requested at other points, but the limited appropriation would not admit of their being established.

The railroad companies generally and the various cotton exchanges throughout the cotton region have, as heretofore, extended many courtesies to our observers, and have aided in promoting the usefulness of this system of reports.

The list of railroads co-operating with the Signal Service in the distribution of the reports, given in my report for the year ending June 30, 1884, remains unchanged:

There are at present 155 stations taking observations and rendering reports, viz, nineteen regular Signal Service stations and 136 special cotton-region stations, as will be seen by the following list:

District centers.	Substations.
Atlanta, Ga.*.....	Anderson, S. C.; Cartersville, Ga.; Columbus, Ga.; Dalton, Ga.; Gainesville, Ga.; Greenville, S. C.; Griffin, Ga.; Macon, Ga.; Newnan, Ga.; Spartanburg, S. C.; Toccoa, Ga.; West Point, Ga.
Augusta, Ga.*.....	Allendale, S. C.; Athens, Ga.; Batesburg, S. C.; Blackville, S. C.; Camak, Ga.; Chester, S. C.; Columbia, S. C.; Greenwood, S. C.; Union Point, Ga.; Washington, Ga.; Waynesborough, Ga.
Charleston, S. C.*.....	Branchville, S. C.; Hardeeville, S. C.; Jacksonborough, S. C.; Kingstree, S. C.; Saint George's, S. C.; Saint Matthew's, S. C.; Yemassee, S. C.
Galveston, Tex.*.....	Austin, Tex.; Beaumont, Tex.; Belton, Tex.; Columbia, Tex.; Corsicana, Tex.; Cuero, Tex.; Dallas, Tex.; Hearne, Tex.; Houston, Tex.; Huntsville, Tex.; Longview, Tex.; Luling, Tex.; Orange, Tex.; *Palestine, Tex.; *San Antonio, Tex.; Sour Lake, Tex.; Tyler, Tex.; Waco, Tex.; Weatherford, Tex.; Weimar, Tex.
Little Rock, Ark.*.....	Arkansas City, Ark.; Brinkley, Ark.; Devall's Bluff, Ark.; *Fort Smith, Ark.; Helena, Ark.; Kensett, Ark.; Madison, Ark.; Magnolia, Ark.; Malvern, Ark.; Monticello, Ark.; Newport, Ark.; Paris, Tex.; Pine Bluff, Ark.; Prescott, Ark.; Russellville, Ark.; Texarkana, Ark.
Memphis, Tenn.*.....	Batesville, Miss.; Bolivar, Tenn.; Brownsville, Tenn.; Corinth, Miss.; Covington, Tenn.; Decatur, Ala.; Dyersburg, Tenn.; Grand Junction, Tenn.; Grenada, Miss.; Hernando, Miss.; Holly Springs, Miss.; Milan, Tenn.; *Naahville, Tenn.; Oxford, Miss.; Paris, Tenn.; Scottsborough, Ala.; Tusculumbia, Ala.; Withe, Tenn.
Mobile, Ala.*.....	Aberdeen, Miss.; Columbus, Miss.; Evergreen, Ala.; Livingston, Ala.; Macon, Miss.; Meridian, Miss.; Okolona, Miss.; Waynesborough, Miss.
Montgomery, Ala.*.....	Birmingham, Ala.; Calera, Ala.; Eufaula, Ala.; Fort Deposit, Ala.; Greenville, Ala.; Marion, Ala.; Pine Apple, Ala.; Opelika, Ala.; Selma, Ala.
New Orleans, La.*.....	Alexandria, La.; Amite City, La.; Brookhaven, Miss.; Cheneyville, La.; Coushatta Chute, La.; Hazlehurst, Miss.; Lafayette, La.; Minden, La.; Natchez, Miss.; Natchitoches, La.; Opelousas, La.; Port Gibson, Miss.; *Shreveport, La.
Savannah, Ga.*.....	Albany, Ga.; Allapaha, Ga.; Bainbridge, Ga.; *Cedar Keys, Fla.; Eastman, Ga.; Fernandina, Fla.; Fort Gaines, Ga.; Jessup, Ga.; Live Oak, Fla.; Millen, Ga.; Quitman, Ga.; Smithville, Ga.; Thomasville, Ga.; Waldo, Fla.; Way Cross, Ga.
Vicksburg, Miss.*.....	Edwards, Miss.; Jackson, Miss.; Lake, Miss.; Monroe, La.
Wilmington, N. C.*.....	*Charlotte, N. C.; Cheraw, S. C.; Florence, S. C.; Goldsborough, N. C.; Lumberton, N. C.; New Berne, N. C.; Raleigh, N. C.; Salisbury, N. C.; Wadesborough, N. C.; Weldon, N. C.

NOTE.—Stations marked thus \* are regular Signal Service stations.

I am, sir, very respectfully, your obedient servant,

F. M. M. BEALL,  
Second Lieutenant, Signal Corps.

The CHIEF SIGNAL OFFICER OF THE ARMY,  
Washington, D. C.

## APPENDIX 59.

*Classified list of stations of the Signal Service, United States Army, in operation on June 30, 1885, compiled in the stations division, for the annual report of the Chief Signal Officer for the year ending June 30, 1885.*

[ (1) Takes one observation per day, at sunset; (2) takes two observations per day; (3) takes three observations per day—all telegraphed; (3a) takes three observations per day—none telegraphed; (5) takes five observations per day—three telegraphed; (5a) takes five observations per day—one telegraphed; (5b) takes five observations per day—none telegraphed; (6) takes six observations per day—three telegraphed.]

*Alabama.*—Stations of the second order: Mobile (5), Montgomery (5). Special display station: Fort Morgan. Special river station: Decatur. Special cotton-region stations: Birmingham, Calera, Decatur, Eufaula, Evergreen, Greenville, Fort Deposit, Livingston, Marion, Pine Apple, Opelika, Scottsborough, Selma, Tusculumbia.

*Alaska.*—Stations of the second order: Fort Alexander (3a), Mumtrekhtagamut (3a), Fort Saint Michael's (3a), Sitka (3a), Unalashka (3a). Stations of the third order: Anvik (2), Atka (2), Cordova Bay (2), Hoochnahoo (2), Hoonyah (2), Kenai (2), Koskokvim (2), Port Etches (2), Pyramid Harbor (2), Tananah (2), Tcha-tow-klin (2), Fort Wrangell (2), Yakutat Bay (2), Golovin Bay (1), Harrishburg (or Juneau City) (1), Mission (1), Nuduckayet (1), Nulato (1), Fort Reliance (1), Saint George Island (1), Ugashik (1).

*Arizona.*—Stations of the second order: Fort Apache (3), Fort Grant, (3a), Prescott (6), Camp Thomas (3a), Yuma (5). Stations of the third order: Apache Pass (1), Maricopa (1), Fort McDowell (1), Phoenix (1), San Carlos Agency (1), Fort Verde (1), Wickenburg (1), Willcox (1). Repair station: Ash Fork.

*Arkansas.*—Stations of the second order: Fort Smith (5), Little Rock (5). Special River stations: Arkansas City, Camden, Fulton, Helena, Newport. Special cotton-region stations: Arkansas City, Brinkley, Devall's Bluff, Helena, Kensett, Madison, Magnolia, Malvern, Monticello, Newport, Pine Bluff, Prescott, Russellville, Texarkana.

*Behring Sea.*—Station of the second order: Behring's Island (3a).

*California.*—Stations of the second order: Fort Bidwell (3a), Cape Mendocino (5), Keeler (5b), Los Angeles (5), Red Bluff (5), Sacramento (5), San Diego (5), San Francisco (6), San Luis Obispo (5). Special River stations: Colusa, Folsom City, Maryville, Oroville.

*Colorado.*—Stations of the second order: Denver (5), Pike's Peak (5b), Montrose (3), West Las Animas (5). Station of the third order: Durango (1).

*Connecticut.*—Stations of the second order: New Haven (5), New London (5b). Special display stations: New Haven Light, Stonington.

*Dakota.*—Stations of the second order: Fort Bennett (3), Bismarck (5), Fort Buford (3), Deadwood (3), Huron (5), Fort Totten (3), Yankton (5). Stations of the third order: Fort Meade (1), Fort Sully (1), Webster (1), Fort Yates (1). Repair station: Larimore.

*Delaware.*—Station of the third order: Cape Henlopen.

*District of Columbia.*—Station of the first order: Washington (6).

*Florida.*—Stations of the second order: Cedar Keys (5), Jacksonville (5), Key West (5), Pensacola (5), Sanford (5). Special display stations: Fernandina, Fort George Island, Saint Augustine, Sand Key Light. Special cotton-region stations: Live Oak, Waldo, Fernandina.

*Georgia.*—Stations of the second order: Atlanta (5), Augusta (5), Savannah (5). Special display stations: Brunswick, Tybee Island. Special cotton-region stations: Albany, Allapaha, Athens, Bainbridge, Camak, Cartersville, Columbus, Dalton, Eastman, Fort Gaines, Gainesville, Griffin, Jessup, Macon, Millen, Newnan, Quitman, Smithville, Thomasville, Toccoa, Union Point, Washington, Way Cross, Waynesborough, West Point.

*Idaho.*—Stations of the second order: Boise City (5b), Lewiston (3). Stations of the third order: Fort Cœur d'Alene (1).

*Illinois*.—Stations of the second order: Cairo (5), Chicago (6), Springfield (5). Special river stations: Beardstown, Grand Tower, Peoria, Mount Carmel, Warsaw.

*Indiana*.—Stations of the second order: Greencastle (5), Indianapolis (5). Special river stations: Evansville. Special printing station: Logansport.

*Indian Territory*.—Station of the second order: Fort Sill (3). Stations of the third order: Fort Reno (1), Fort Supply (1). Repair station: Cantonment.

*Iowa*.—Stations of the second order: Davenport (5), Des Moines (5), Dubuque (5a), Keokuk (5). Special river stations: Le Claire, Muscatine. Special printing station: Burlington.

*Kamitchalka*.—Station of the third order: Petropaulovski (2).

*Kansas*.—Stations of the second order: Dodge City (5), Leavenworth (5), Concordia (5).

*Kentucky*.—Station of the second order: Louisville (5). Special river stations: Burnside, Paducah.

*Louisiana*.—Stations of the second order: New Orleans (5), Shreveport (5). Special display station: Port Eads. Special river stations: Alexandria, Bayou Sara, Coushatta Chute, Delhi, Girard, Monroe, West Melville. Special cotton-region stations: Alexandria, Amite City, Cheneyville, Coushatta Chute, Lafayette, Minden, Monroe, Natchitoches, Opelousas.

*Maine*.—Stations of the second order: Eastport (5), Portland (5). Special display stations: Bath, Boothbay, Rockland, Southwest Harbor. Special printing station: Bangor.

*Maryland*.—Station of the second order: Baltimore (5). Station of the third order: Ocean City (1).

*Massachusetts*.—Station of the second order: Boston (6). Special display stations: Bass River Light, Fall River, Gloucester, Highland Light, Hyannis, Marblehead, New Bedford, Newburyport, Provincetown, Wood's Holl.

*Michigan*.—Stations of the second order: Alpena (5), Detroit (5), Escanaba (5), Grand Haven (5), Mackinaw City (5), Marquette (5), Port Huron (5). Special display stations: Bay City, Charlevoix, Cheboygan, East Tawas, Elk Rapids, Frankfort, Ludington, Manistee, Menominee, Montague, Muskegon, Northport, Pentwater, Petoskey, Saint Joseph, Sand Beach, South Haven, Traverse City.

*Minnesota*.—Stations of the second order: Duluth (3), Moorhead (5), Saint Paul (5), Saint Vincent (5). Special river station: Wabasha.

*Mississippi*.—Station of the second order: Vicksburg (5). Special cotton-region stations: Aberdeen, Batesville, Brookhaven, Columbus, Corinth, Edwards, Grenada, Hazlehurst, Hernando, Holly Springs, Jackson, Lake, Macon, Meridian, Natchez, Okolona, Oxford, Port Gibson, Waynesborough. Special river station: Yazoo City.

*Missouri*.—Stations of the second order: Saint Louis (6), Lamar (5). Special river stations: Boonville, Brunswick, Hermann, Jerome, Kansas City, Louisiana, Saint Joseph.

*Montana*.—Stations of the second order: Fort Assinaboine (3), Fort Benton (3), Fort Custer (3), Helena (3), Fort Maginnis (3), Poplar River (3), Fort Shaw (3). Repair stations: Galpin, Glendive, Terry's Landing.

*Nebraska*.—Stations of the second order: North Platte (5), Omaha (5), Valentine (5). Special river station: Plattsmouth. Repair station: Fort Robinson.

*Nevada*.—Station of the second order: Winnemucca (5).

*New Hampshire*.—Station of the second order: Mount Washington (5). Special display station: Portsmouth.

*New Jersey*.—Stations of the second order: Atlantic City (5), Barnegat City (5), Cape May (3a), Sandy Hook (5). Station of the third order: Little Egg Harbor (1).

*New Mexico*.—Stations of the second order: Fort Stanton (3), Santa Fé (5). Stations of the third order: Lava (1), Watrous (1).

*New York*.—Stations of the second order: Albany (5), Buffalo (5), New York City (6), Oswego (5), Rochester (5). Special display stations: Cape Vincent, Charlotte, City Island, Dunkirk, North Fair Haven.

*North Carolina*.—Stations of the second order: Charlotte (5), Hatteras (5), Kittyhawk (5), Fort Macon (5), Smithville (5), Wilmington (5). Stations of the third order: New River Inlet (1), Wash Woods (1). Special cotton-region stations: Goldsborough, Lumberton, New-Berne, Raleigh, Salisbury, Wadesborough, Weldon.

*Ohio*.—Stations of the second order: Cincinnati (6), Cleveland (5), Columbus (5), Sandusky (5), Toledo (5). Special river station: Marietta. Special display station: Ash-tabula.

*Oregon*.—Stations of the second order: Portland (5), Roseburg (5). Stations of the third order: Ashland (1), Astoria (1), Fort Klamath (1), Lakeview (1), Linkville (1). Special river stations: Albany, Eugene City, Umatilla.

*Pennsylvania*.—Stations of the second order: Erie (5), Philadelphia (6), Pittsburg (6). Special river stations: Brookville, Brownsville, Clarion, Confluence, Freeport, Johnstown, Mahoning, New Geneva, Oil City, Parker's Landing, Saltsburg, Warren.

*Rhode Island.*—Station of the second order: Block Island (5). Stations of the third order: Narragansett Pier (1); Point Judith (1). Special display stations: Bristol, Newport, Southeast Light, Block Island.

*South Carolina.*—Station of the second order: Charleston (5). Special display station: Port Royal. Special cotton-region stations: Allendale, Anderson, Batesburg, Blackville, Branchville, Cheraw, Chester, Columbia, Florence, Greenville, Greenwood, Hardeeville, Jacksonborough, Kingstree, Saint George's, Saint Matthew's, Spartanburg, Yemassee.

*Tennessee.*—Stations of the second order: Chattanooga (5), Knoxville (5), Memphis (5), Nashville (5). Special river stations: Charleston, Clinton, Johnsonville, Carthage, Kingston, Leadvale, Rockwood, Loudon, Strawberry Plains. Special cotton-region stations: Bolivar, Brownsville, Covington, Dyersburg, Grand Junction, Milan, Paris, Withe.

*Texas.*—Stations of the second order: Brownsville (3), Fort Concho (5), Fort Davis (3a), Fort Elliott (3), El Paso (5), Galveston (5), Indianola (5), Palestine (5), Rio Grande City (5), San Antonio (3), Fort Stockton (3). Stations of the third order: Henrietta (1), Marfa (1). Special display station: Corpus Christi. Special cotton-region stations: Austin, Beaumont, Belton, Columbia, Corsicana, Cuero, Dallas, Hearne, Houston, Huntsville, Longview, Luling, Orange, Paris, San Antonio, Sour Lake, Tyler, Waco, Weatherford, Weimar.

*Utah.*—Stations of the second order: Salt Lake City (5), Frisco (5b).

*Virginia.*—Stations of the second order: Cape Henry (5), Chincoteague (5), Lynchburg (5), Fort Myer (5), Norfolk (5). Special display station: Fort Monroe.

*Washington Territory.*—Stations of the second order: Fort Canby (5), Dayton (3a), Olympia (5), Port Angeles (3), Spokane Falls (3), Tatoosh Island (3). Stations of the third order: Neah Bay (1), Pysht (1), Fort Spokane (1).

*West Virginia.*—Special river stations: Morgantown, Rowlesburg, Weston, Wheeling.

*Wisconsin.*—Stations of the second order: La Crosse (5), Milwaukee (5). Special display stations: Ahnapee, Green Bay, Kenosha, Kewaunee, Manitowoc, Racine, Sheboygan, Sturgeon Bay. Special river station: Prescott.

*Wyoming.*—Stations of the second order: Fort Bridger (5), Cheyenne (5). Station of the third order: Fort Laramie (1). Repair station: Carter.

F. M. M. BEALL,  
Second Lieutenant, Signal Corps.

## APPENDIX 60.

## REPORT ON THE DISPLAY OF CAUTIONARY SIGNALS AT SPECIAL STATIONS.

SIGNAL OFFICE, WAR DEPARTMENT,  
Washington City, June 30, 1885.

SIR: I have the honor to make the following report upon the special cautionary-signal display stations of the Signal Service in operation during the year ending June 30, 1885: The special display stations are located on the Great Lakes, the Atlantic coast, and the Gulf coast. They are grouped in sections, each section being under the supervision of the observer in charge of a regular Signal Service station as near the center of the section as possible, who receives orders to hoist and lower signals at stations in his section direct from this office.

Displaymen hoist the cautionary signal upon receipt of the order from the observer in charge of their section and acknowledge receipt to him immediately by telegraph. They also bulletin the order and accompanying message for the information of shipping interests. When signals are ordered down they acknowledge receipt by telegraph, giving the maximum velocity of wind and direction during the display. In the absence of instruments, the wind velocity is determined by the Signal Service scale.

The cautionary signal when displayed signifies:

1. That it is thought probable from a study of the weather reports received at the central office, that dangerous winds will prevail at or in the vicinity of the place at which the signal is displayed.
2. That the danger appears to be so great as to demand precaution on the part of mariners and others, and general preparation for rough weather.
3. It calls for frequent examination of local barometers, and other instruments, and the study of the local signs of the weather, as clouds, &c.

Each display station is supplied with two or more red flags, one 6 feet and the other 8 feet square, having square black centers one-third the size of the flag; two red signal-lanterns, one large flag-staff, and one wind-vane. Stations designated to display cautionary off-shore or northwest signals are, in addition, supplied with white flags with black centers and with white lanterns. The flag-staff is at least 25 feet in height, and so placed as to make the signal clearly visible from the harbor and shipping. The necessary stationery and supply of Forms 112 are also sent to each station.

Form 112, containing the data relative to the display of signals, is forwarded weekly to the observer in charge of the section from each display station in the section.

As soon as practicable after a cautionary signal has been lowered, the displayman collects from mariners and others, data concerning the violence of the storm, the nature and extent of disasters and other casualties, and the benefits derived from the display of the signals. These statements include everything within the displayman's personal knowledge. The information so collected is entered in the column of "Remarks," on Form 112, or, when that column is filled, it is made on a sheet of paper, which is afterwards attached to that form. It is also stated whether any storm passed over the station during the week for which cautionary signals were not ordered, and newspaper clippings having reference to storms are used to accompany the report.

Displaymen receive all instructions from or through, and render all reports and bills to, the section centers. Observers in charge of section centers receive, examine, and certify to the correctness of all reports and bills from special display stations, and then forward them to this office.

If reports or bills are not received at the section centers within three days after the date on which they are due, they are called for by mail. Any persistent neglect of the displaymen in this direction is reported to the Chief Signal Officer, with such recommendation as the observer may consider proper to make to improve the service. When errors are detected in Forms 112 which cannot be remedied at the section centers, they are returned to the displayman for correction.

In certifying to bills great care is exercised to see that the time for which charge is made is correct, the vouchers properly signed, &c. Bills are not certified to until the

reports which they cover have been received and acted upon. Each bill bears the following certificate on its face, signed by the observer in charge of the section center:

"The account is correct and just, and the services have been rendered as stated."

Bills are rendered on Form 9 (old Form 62a), and filled out as follows:

"For services rendered as displayman, at \_\_\_\_\_, for the month of \_\_\_\_\_, 188—, for \_\_\_\_\_ (give the number of days), at \_\_\_\_\_ cents per day."

Observers in charge of centers are held responsible for the correctness of all bills certified to by them, and they are required to assure themselves of their accuracy before forwarding to this office.

As a rule the special display stations on the lakes display signals only during the season of navigation, which generally continues from about April 15 to December 15 of each year; those on the Atlantic and Gulf coasts display throughout the year. The lake stations at South Haven, Mich., Saint Joseph, Mich., and Ludington, Mich., also display signals during the entire year.

Displaymen are paid by this Service only during the season for which signals are displayed.

There are fifty-nine displaymen who receive pay at the rate of 25 cents per day; one at 35 cents per day; two at 50 cents per day, and one at \$15 per month. The displaymen at Wood's Holl, Mass., receives \$3 per month extra compensation for special services.

The display stations are thoroughly organized and equipped, and the displaymen fully instructed in their duties, which they perform conscientiously and intelligently. The large amount of valuable property saved and the assistance rendered mariners and others each year by means of this system of storm warnings, make it impossible to overestimate its importance to the shipping and commercial interests of the country.

The following have been established as special display stations during the year: Cheboygan, Mich., July, 23, 1884; repeats Mackinaw City signals. Port Eads, La., January 15, 1885, will repeat New Orleans signals. Arrangements for the display of signals have not yet been made at this point.

The following special display stations have been discontinued during the year: Fire Island, N. Y., December 1, 1884; Fort Mackinac, Mich., March 14, 1885; Saint Ignace, Mich., March 14, 1885.

The order of October 6, 1884, establishing Jump, La., as a special-display station, was revoked January 15, 1885.

The following is a list of stations inspected during the year. The inspectors state that they found the displaymen to be energetic and competent men, the signals considered to be of great value, and much interest manifested at all places where signals are displayed. The property was found generally in good condition.

Station inspected.	Date.	Name of inspector.
1885.		
Ahnapee, Wis.....	May 23.....	Sergt. S. W. Rhode.
Ashtabula, Ohio.....	April 24.....	Sergt. Peter Wood.
Bath, Me.....	April 27.....	Sergt. G. Liebmann.
Bay City, Mich.....	April 29.....	Sergt. N. B. Conger.
Brunswick, Ga.....	March 18.....	Sergt. S. C. Emery.
Bass River Light, Mass.....	May 22.....	Sergt. O. B. Cole.
Bristol, R. I.....	June 15.....	Sergt. J. G. Lynch.
Boothbay, Me.....	May 4.....	Sergt. G. Leibmann.
Cape Vincent, N. Y.....	April 23.....	Sergt. J. G. Linsley.
Charlotte, N. Y.....	April 21.....	Sergt. E. W. McGann.
Corpus Christi, Tex.....	May 12.....	Sergt. I. A. Reed.
Charlevoix, Mich.....	June 6.....	Sergt. T. B. Jennings.
Cheboygan, Mich.....	June 9.....	Sergt. T. B. Jennings.
City Island, N. Y.....	April 24.....	Sergt. W. W. Eichelberger.
Dunkirk, N. Y.....	April 25.....	Sergt. Peter Wood.
Elk Rapids, Mich.....	June 6.....	Sergt. T. B. Jennings.
East Tawas, Mich.....	April 30.....	Sergt. N. B. Conger.
Fernandina, Fla.....	April 28.....	Sergt. J. W. Smith.
Fort Monroe, Va.....	April 23.....	Sergt. J. F. Sherry.
Frankfort, Mich.....	June 1.....	Sergt. T. B. Jennings.
Fall River, Mass.....	June 16.....	Sergt. J. G. Lynch.
Fort George Island, Fla.....	April 28.....	Sergt. J. W. Smith.
Fort Morgan, Ala.....	April 23.....	Sergt. A. Fritchard.
Gloucester, Mass.....	June 9.....	Sergt. O. B. Cole.
Green Bay, Wis.....	June 1.....	Sergt. S. W. Rhode.
Hyannis, Mass.....	May 20.....	Sergt. O. B. Cole.
Highland Light, Mass.....	May 24.....	Sergt. O. B. Cole.
Kenosha, Wis.....	May 20.....	Sergt. S. W. Rhode.
Kewaunee, Wis.....	May 26.....	Sergt. S. W. Rhode.
Ludington, Mich.....	May 31.....	Sergt. T. B. Jennings.
Manistee, Mich.....	May 31.....	Sergt. T. B. Jennings.
Manitowoc, Wis.....	May 23.....	Sergt. S. W. Rhode.
Montague, Mich.....	May 30.....	Sergt. T. B. Jennings.

Station inspected.	Date.	Name of inspector.
1885.		
Muskegon, Mich.	May 29	Sergt. T. B. Jennings.
Marblehead, Mass.	June 9	Sergt. O. B. Cole.
Menominee, Mich.	June 3	Sergt. S. W. Rhode.
New Bedford, Mass.	May 18	Sergt. O. B. Cole.
North Fair Haven, N. Y.	April 22	Sergt. J. G. Linsley
Newport, R. I.	June 17	Sergt. J. G. Lynch.
Northport, Mich.	June 4	Sergt. T. B. Jennings.
Newburyport, Mass.	June 10	Sergt. O. B. Cole.
New Haven Light, Conn.	May 4	Sergt. J. H. Sherman.
Pentwater, Mich.	May 30	Sergt. T. B. Jennings.
Port Royal, S. C.	March 18	Sergt. S. C. Emery.
Petoskey, Mich.	June 8	Sergt. T. B. Jennings.
Portsmouth, N. H.	June 10	Sergt. O. B. Cole.
Provincetown, Mass.	May 23	Sergt. O. B. Cole.
Racine, Wis.	May 19	Sergt. S. W. Rhode.
Rockland, Me.	April 29	Sergt. G. Liebmann.
Sand Beach, Mich.	May 2	Sergt. N. B. Conger.
Sand Key Light, Fla.	April 27	Sergt. J. Harvey Smith.
Sheboygan, Wis.	May 22	Sergt. S. W. Rhode.
Stonington, Conn.	May 18	Sergt. J. G. Lynch.
Southeast Light, R. I.	April 27	Sergt. J. T. Eiker.
South Haven, Mich.	May 28	Sergt. T. B. Jennings.
Southwest Harbor, Me.	May 1	Sergt. G. Liebmann.
Saint Augustine, Fla.	April 28	Sergt. J. W. Smith.
Saint Joseph, Mich.	May 26	Sergt. T. B. Jennings.
Sturgeon Bay, Wis.	May 30	Sergt. S. W. Rhode.
Traverse City, Mich.	June 5	Sergt. T. B. Jennings.
Tybee Island, Ga.	March 18	Sergt. S. C. Emery.
Wood's Holl, Mass.	May 20	Sergt. O. B. Cole.

The following is the list of special display stations now in operation, arranged in sections:

*Mackinaw section* (Chicago, Ill., center).—Charlevoix, Mich.; Cheboygan, Mich.; Elk Rapids, Mich.; Frankfort, Mich.; Northport, Mich.; Petoskey, Mich.; Traverse City, Mich.

*Grand Haven section* (Chicago, Ill., center).—Ludington, Mich.; Manistee, Mich.; Montague, Mich.; Muskegon, Mich.; Pentwater, Mich.; Saint Joseph, Mich.; South Haven, Mich.

*Milwaukee section* (Milwaukee, Wis., center).—Kenosha, Wis.; Manitowoc, Wis.; Sheboygan, Wis.; Racine, Wis.

*Green Bay section* (Milwaukee, Wis., center).—Ahnapee, Wis.; Green Bay, Wis.; Sturgeon Bay, Wis.; Kewaunee, Wis.; Menominee, Mich.

*Saginaw Bay section* (Detroit, Mich., center).—Bay City, Mich.; East Tawas, Mich.; Sand Beach, Mich.

*Erie section* (Erie, Pa., center).—Ashtabula, Ohio; Dunkirk, N. Y.

*Oswego section* (Oswego, N. Y., center).—Cape Vincent, N. Y.; North Fair Haven, N. Y.

*Portland section* (Portland, Me., center).—Bath, Me.; Boothbay, Me.; Rockland, Me.; Southwest Harbor, Me.

*Boston section* (Boston, Mass., center).—Gloucester, Mass.; Marblehead, Mass.; Newburyport, Mass.; Portsmouth, N. H.

*Wood's Holl section* (Boston, Mass., center).—Bass River Light, Mass.; Highland Light, Mass.; Hyannis, Mass.; New Bedford, Mass.; Provincetown, Mass.; Wood's Holl, Mass.

*Newport section* (New London, Conn., center).—Bristol, R. I.; Fall River, Mass.; Newport, R. I.; Stonington, Conn.

*Narragansett section* (Narragansett Pier, R. I., center).—Southeast Light, R. I.

*Savannah section* (Savannah, Ga., center).—Brunswick, Ga.; Port Royal, S. C.; Tybee Island, Ga.

*Jacksonville section* (Jacksonville, Fla., center).—Fernandina, Fla.; Fort George Island, Fla.; Saint Augustine, Fla.

The following named stations repeat cautionary signal orders issued to the stations set opposite their respective names:

Charlotte, N. Y.	Rochester, N. Y.
City Island, N. Y.	New York City.
Corpus Christi, Tex.	Indianola, Tex.
Fort Morgan, Ala.	Mobile, Ala.
New Haven Light, Conn.	New Haven, Conn.
Port Eads, La.	New Orleans, La.
Sand Key Light, Fla.	Key West, Fla.

Milwaukee, Wis., notifies by telegraph the postmasters at Ashland, Wis., and Houghton, Mich., of orders to hoist cautionary signals at Duluth, Minn., and Marquette, Mich.

Pensacola, Fla., notifies Apalachicola, Fla., of all cautionary signal orders for Pensacola.

Fort Monroe, Va., receives orders to hoist signals from Washington, D. C.

I am, very respectfully, your obedient servant.

F. M. M. BEALL,  
*Second Lieutenant, Signal Corps.*

The CHIEF SIGNAL OFFICER OF THE ARMY,  
*Washington, D. C.*



## APPENDIX 61.

*List of stations of the first and second order, Signal Service, United States Army, established since November 1, 1870, together with the dates on which those not in operation on June 30, 1885, were closed.*

Station.	Established.	Remarks.
Albany, N. Y.	Dec. 22, 1873	
Alexander, Fort, Alaska	Aug. 1, 1881	
Alpena, Mich.	Sept. 10, 1872	
Apache, Fort, Ariz.	Oct. 9, 1877	
Assinaboine, Fort, Mont.	Oct. 6, 1879	
Atlanta, Ga.	Sept. 25, 1878	
Atlantic City, N. J.	Dec. 10, 1873	
Augusta, Ga.	Nov. 2, 1870	
Baltimore, Md.	Jan. 1, 1871	
Barnegat City, N. J.	Dec. 10, 1873	
Behring's Island, Behring Sea.	May 22, 1882	
Bennett, Fort, Dak.	Dec. 22, 1879	
Benton, Fort, Mont.	Nov. 25, 1871	Closed July 31, 1876; re-established October 11, 1879.
Bidwell, Fort, Cal.	Jan. 1, 1885	
Billings, Mont.	Jan. 1, 1883	Closed June 24, 1883.
Bismarck, Dak.	Sept. 15, 1874	
Block Island, R. I.	Sept. 1, 1880	
Boerne, Tex.	May 6, 1876	Closed July 28, 1880.
Boise City, Idaho	July 1, 1877	
Boston, Mass.	Nov. 1, 1870	
Brackettville, Tex.	Sept. 1, 1875	Closed December 16, 1881.
Breckenridge, Minn.	Apr. 10, 1872	Closed November 30, 1880.
Bridger, Fort, Wyo.	Jan. 1, 1885	
Brownsville, Tex.	Aug. 25, 1875	
Buffalo, N. Y.	Nov. 1, 1870	
Buford, Fort, Dak.	Oct. 23, 1878	
Burkes, Ariz.	Dec. 5, 1877	Closed December 4, 1880.
Burlington, Vt.	May 24, 1871	Closed June 15, 1883.
Cañero, Ill.	June 1, 1871	
Campo, Cal.	Jan. 1, 1874	Closed September 30, 1882.
Canby, Fort, Wash.	Sept. 1, 1883	
Cape Hatteras, N. C.	Aug. 18, 1874	Closed November 30, 1880.
Cape Henry, Va.	Dec. 15, 1873	
Cape Lookout, N. C.	May 14, 1876	Closed December 31, 1880.
Cape May, N. J.	May 24, 1871	
Cape Mendocino, Cal.	July 27, 1882	
Castroville, Tex.	Sept. 29, 1875	Closed March 29, 1882.
Cedar Keys, Fla.	Nov. 7, 1879	
Champaign, Ill.	Oct. 13, 1880	Closed March 31, 1883.
Charleston, S. C.	Jan. 5, 1871	
Charlotte, N. C.	Oct. 6, 1878	
Chattanooga, Tenn.	Jan. 8, 1879	
Cheyenne, Wyo.	Nov. 1, 1870	
Chicago, Ill.	Nov. 1, 1870	
Chimo, Fort, Ungava Bay, Labrador	Nov. 1, 1882	Closed August 25, 1884.
Chincocheague, Va.	Mar. 16, 1880	
Cincinnati, Ohio.	Nov. 1, 1870	
Cleveland, Ohio.	Nov. 1, 1870	
Coleman City, Tex.	July 1, 1877	Closed September 5, 1883.
Colorado Springs, Colo.	Nov. 12, 1873	Closed July 31, 1876.
Columbus, Ohio.	July 1, 1878	
Concho, Fort, Tex.	Oct. 10, 1875	
Concordia, Kans.	Jan. 27, 1885	
Corinne, Utah.	Sept. 1, 1871	Closed March 14, 1874.
Corsicana, Tex.	Sept. 15, 1874	Closed October 31, 1881.
Craig, Fort, N. Mex.	May 21, 1877	Closed June 27, 1879.
Custer, Fort, Mont.	Dec. 5, 1878	Closed December 31, 1882; re-established July 21, 1883.
Davenport, Iowa	May 24, 1871	
Davis, Fort, Texas	Dec. 24, 1877	
Dayton, Wash.	July 1, 1879	
Deadwood, Dak.	Dec. 18, 1877	Closed June 1, 1878; re-established November 1, 1878.
Decatur, Tex.	Feb. 1, 1876	Closed September 10, 1882.

*List of stations of the first and second order, Signal Service, United States Army, established since November 1, 1870, together with the dates on which those not in operation on June 30, 1885, were closed—Continued.*

Station.	Established.	Remarks.
Delaware Breakwater, Delaware.....	Jan. 28, 1880	Closed March 1, 1885.
Denison, Tex.....	Dec. 16, 1874	Closed March 31, 1883.
Denver, Colo.....	Nov. 19, 1871	
Des Moines, Iowa.....	Aug. 1, 1878	
Detroit, Mich.....	Nov. 1, 1870	
Dodge City, Kans.....	Sept. 15, 1874	
Dubuque, Iowa.....	July 10, 1873	
Duluth, Minn.....	Nov. 1, 1870	
Eagle Pass, Tex.....	Jan. 19, 1875	Closed June 15, 1883.
Eagle Rock, Idaho.....	Dec. 3, 1880	Closed June 15, 1883.
Eastport, Me.....	Apr. 1, 1873	
Elliott, Fort, Tex.....	Nov. 29, 1879	
El Paso, Tex.....	Nov. 5, 1877	
Erie, Pa.....	May 25, 1873	
Escanaba, Mich.....	May 24, 1871	
Evanston, Ill.....	Aug. 31, 1875	Closed July 31, 1876.
Florence, Ariz.....	Nov. 12, 1874	Closed April 30, 1882.
Fort Smith, Ark.....	June 1, 1882	
Fredericksburg, Tex.....	Mar. 14, 1876	Closed February 25, 1883.
Frisco, Utah.....	Jan. 27, 1885	
Galveston, Tex.....	Apr. 19, 1871	
Gibson, Fort, Ind. T.....	Apr. 1, 1873	Closed May 13, 1882.
Grand Haven, Mich.....	May 24, 1871	
Grant, Fort, Ariz.....	Nov. 1, 1875	
Greencastle, Ind.....	July 23, 1884	
Griffin, Fort, Tex.....	July 1, 1875	Closed April 14, 1882.
Hatteras, N. C.....	Dec. 1, 1880	
Helena, Mont.....	Oct. 15, 1879	
Henrietta, Tex.....	Feb. 1, 1877	Closed May 25, 1878; re-established February 9, 1879; closed March 31, 1883.
Hidalgo (Edinburg), Tex.....	Feb. 1, 1879	Closed January 27, 1882.
Huron, Dak.....	July 1, 1881	
Indianapolis, Ind.....	Feb. 10, 1871	
Indianola, Tex.....	May 1, 1872	
Jacksborough, Tex.....	May 8, 1875	Closed June 15, 1883.
Jacksonville, Fla.....	Sept. 11, 1871	
Keeler, Cal.....	Feb. 1, 1885	
Keogh, Fort, Mont.....	Nov. 18, 1878	Closed June 15, 1883.
Keokuk, Iowa.....	July 16, 1871	
Key West, Fla.....	Nov. 1, 1870	
Kitty Hawk, N. C.....	Jan. 15, 1875	
Knoxville, Tenn.....	Jan. 1, 1871	
La Crosse, Wis.....	Oct. 15, 1872	
Lady Franklin Bay, Grinnell Land.....	Aug. 5, 1881	Closed August 9, 1883.
Lake City, Fla.....	Nov. 1, 1879	Closed October 31, 1874.
Lamar, Mo.....	Oct. 17, 1884	
La Mesilla, N. Mex.....	June 16, 1876	Closed August 6, 1882.
Laredo, Tex.....	Dec. 16, 1875	Closed December 16, 1881.
Lead City, Dak.....	June 1, 1878	Closed October 31, 1878.
Leavenworth, Kans.....	May 21, 1871	
Lewiston, Idaho.....	July 1, 1879	
Lexington, Ky.....	Oct. 1, 1872	Closed July 24, 1876.
Little Rock, Ark.....	July 1, 1879	
Long Branch, N. J.....	Dec. 10, 1873	Closed July 8, 1876.
Los Angeles, Cal.....	July 1, 1877	
Louisville, Ky.....	Sept. 11, 1871	
Lynchburg, Va.....	May 24, 1871	
Mackinaw City, Mich.....	Aug. 20, 1882	
Macon, Fort, N. C.....	May 23, 1878	
Madison, Wis.....	Sept. 29, 1878	Closed March 31, 1883.
Maginnis, Fort, Mont.....	July 14, 1882	
Malone, N. Y.....	Aug. 1, 1875	Closed April 30, 1877.
Manhattan, Kans.....	Dec. 21, 1875	Closed July 31, 1876.
Marquette, Mich.....	May 1, 1871	Office burned February 1, 1885; re-established March 1, 1885.
Mason, Tex.....	Feb. 7, 1876	Closed April 14, 1882.
McKavett, Fort, Tex.....	Oct. 19, 1875	Closed February 19, 1883.
Memphis, Tenn.....	Feb. 28, 1871	
Milwaukee, Wis.....	Nov. 1, 1870	
Missoula, Fort, Mont.....	Dec. 15, 1879	Closed June 15, 1883.
Mobile, Ala.....	Nov. 7, 1870	Office burned November 17, 1880; re-established November 22, 1880.
Montgomery, Ala.....	Nov. 9, 1870	
Montrose, Colo.....	Feb. 5, 1885	
Moorhead, Minn.....	Jan. 1, 1881	
Morgantown, W. Va.....	Jan. 25, 1873	Closed March 31, 1883.
Mount Washington, N. H.....	Dec. 1, 1870	
Mumtrekhlagamut, Alaska.....	Mar. 24, 1885	
Nashville, Tenn.....	Nov. 1, 1870	

*List of stations of the first and second order, Signal Service, United States Army, established since November 1, 1870, together with the dates on which those not in operation on June 30, 1885, were closed—Continued.*

Station.	Established.	Remarks.
New Haven, Conn.	Dec. 10, 1872	
New London, Conn.	Jan. 10, 1871	
New Orleans, La.	Nov. 1, 1870	
Newport, R. I.	Aug. 1, 1875	Closed March 31, 1883.
New York City	Nov. 1, 1870	
Norfolk, Va.	Jan. 1, 1871	
North Platte, Nebr.	Sept. 15, 1874	
Olympia, Wash.	July 1, 1877	
Omaha, Nebr.	Nov. 1, 1870	
Ooglaamie, Point Barrow, Alaska.	Oct. 17, 1881	Closed August 7, 1883.
Oswego, N. Y.	Nov. 1, 1870	
Palestine, Tex.	Dec. 3, 1881	
Peck's Beach, N. J.	Dec. 10, 1873	Closed February 23, 1876.
Pembina, Dak.	Nov. 1, 1872	Closed September 3, 1880.
Pensacola, Fla.	Oct. 27, 1879	
Philadelphia, Pa.	Jan. 1, 1871	
Phoenix, Ariz.	Aug. 18, 1876	Closed December 31, 1881.
Pike's Peak, Colo.	Nov. 1, 1873	
Pilot Point, Tex.	June 18, 1875	Closed March 31, 1881.
Pioche, Nev.	July 29, 1877	Closed June 15, 1883.
Pittsburg, Pa.	Nov. 1, 1870	
Poplar River, Mont.	May 1, 1882	
Port Angeles, Wash.	Feb. 1, 1885	
Port Eads, La.	Apr. 10, 1881	Closed March 31, 1883.
Port Huron, Mich.	July 25, 1874	
Portland, Me.	Jan. 15, 1871	
Portland, Oreg.	Nov. 1, 1871	
Portsmouth, N. C.	Apr. 23, 1876	Closed July 31, 1888.
Prescott, Ariz.	Nov. 19, 1873	
Provincetown, Mass.	Feb. 15, 1882	Closed April 1, 1884.
Punta Rassa, Fla.	Aug. 15, 1871	Closed June 15, 1883.
Red Bluff, Cal.	July 1, 1877	Office burned August 2, 1880; re-established August 16, 1880; burned August 18, 1882; re-established Sept. 23, 1882.
Rio Grande City, Tex.	May 28, 1875	Closed September 30, 1882; re-established October 1, 1883.
Rochester, N. Y.	Nov. 1, 1870	Closed June 15, 1883; re-established October 10, 1883.
Roseburg, Oreg.	July 15, 1877	Office burned August 19, 1884; re-established October 25, 1884.
Sacramento, Cal.	July 1, 1877	
Saint Louis, Mo.	Nov. 1, 1870	
Saint Marks, Fla.	Nov. 10, 1874	Closed October 30, 1879.
Saint Michael's, Fort, Alaska.	June 27, 1874	
Saint Paul, Minn.	Nov. 1, 1870	
Saint Paul's Island, Alaska.	Aug. 18, 1872	Closed December 31, 1882.
Saint Vincent, Minn.	Sept. 5, 1880	
Salt Lake City, Utah.	Mar. 19, 1874	
San Antonio, Tex.	Sept. 22, 1875	Closed June 15, 1883; re-established January 1, 1885.
San Diego, Cal.	Nov. 1, 1871	
Sandusky, Ohio.	Aug. 2, 1877	Closed March 31, 1883; re-established July 20, 1883.
Sandy Hook, N. J.	Dec. 10, 1873	
Sanford, Fla.	Sept. 1, 1882	
San Francisco, Cal.	Mar. 8, 1871	
San Luis Obispo, Cal.	Jan. 27, 1885	
Santa Fé, N. Mex.	Nov. 20, 1871	Closed June 15, 1883; re-established September 24, 1884.
Savannah, Ga.	Jan. 1, 1871	
Shaw, Fort, Mont.	Apr. 1, 1880	
Shreveport, La.	Sept. 3, 1871	
Sill, Fort, Ind. T.	June 23, 1875	
Silver City, N. Mex.	May 15, 1878	Closed March 31, 1883.
Sitka, Alaska.	Mar. 30, 1881	
Smithville, N. C.	Oct. 15, 1875	
Socorro, N. Mex.	July 1, 1879	Closed May 23, 1881.
Spokane Falls, Wash.	Feb. 5, 1881	Office burned November 29, 1884; re-established November 30, 1884.
Springfield, Ill.	July 1, 1879	
Springfield, Mass.	July 19, 1873	Closed December 31, 1882.
Springfield, Mo.	Jan. 3, 1882	Closed June 15, 1883.
Squan Beach, N. J.	Dec. 10, 1873	Closed February 28, 1876.
Stanton, Fort, N. Mex.	Jan. 1, 1885	
Stanwix, Ariz.	Jan. 25, 1876	Closed December 1, 1877.
Starkville, Miss.	May 4, 1882	Closed June 15, 1883.
Stevenson, Fort, Dak.	Sept. 19, 1878	Closed June 15, 1883.
Stockton, Fort, Tex.	Feb. 26, 1876	
Sully, Fort, Dak.	May 1, 1872	Closed October 31, 1877.

*List of stations of the first and second order, Signal Service, United States Army, established since November 1, 1870, together with the dates on which those not in operation on June 30, 1885, were closed—Continued.*

Station.	Established.	Remarks.
Tatoosh Island, Wash.....	Oct. 1, 1883	
Thatcher's Island, Mass.....	Dec. 26, 1875	Closed June 1, 1883.
Thomas, Camp, Ariz.....	Sept. 22, 1877	
Toledo, Ohio.....	Nov. 1, 1870	
Totten, Fort, Dak.....	Oct. 8, 1888	
Tucson, Ariz.....	Oct. 30, 1875	Closed June 15, 1883.
Tybee Island, Ga.....	June 11, 1874	Closed February 15, 1879.
Umatilla, Oreg.....	July 15, 1877	Closed March 31, 1883.
Unalakha, Alaska.....	Aug. 18, 1878	
Uvalde, Tex.....	Sept. 6, 1875	Closed October 31, 1882.
Valentine, Nebr.....	Jan. 27, 1885	
Verde, Fort, Ariz.....	Nov. 9, 1874	Closed October 10, 1883.
Vicksburg, Miss.....	Sept. 10, 1871	Office burned April 21, 1885; re-established April 23, 1885.
Virginia City, Mont.....	Nov. 25, 1871	Closed November 18, 1880.
Visalia, Cal.....	July 1, 1877	Closed June 15, 1883.
Washakie, Fort, Wyo.....	Dec. 1, 1881	Closed June 15, 1883.
Washington City.....	Nov. 1, 1870	
West Las Animas, Colo.....	Oct. 1, 1881	
Wickenburg, Ariz.....	Jan. 6, 1874	Closed April 30, 1882.
Williamsport, Pa.....	Jan. 1, 1882	Closed June 15, 1883.
Wilmington, N. C.....	Jan. 1, 1871	
Winnemucca, Nev.....	July 1, 1877	Closed June 15, 1883; re-established October 6, 1884.
Wood's Holl, Mass.....	Dec. 4, 1872	Closed January 31, 1882.
Wytheville, Va.....	Jan. 16, 1873	Closed July 31, 1876.
Yankton, Dak.....	Apr. 1, 1873	
Yuma, Ariz.....	Nov. 18, 1873	

## APPENDIX '63.

*Report of the Telegraph Division for the year ending June 30, 1885.*

SIGNAL OFFICE, Washington, July 1, 1885.

The regular tri-daily cipher weather reports were received during the year over the wires of the Western Union, International Ocean, Florida, Gulf Coast, and Northwestern Telegraph Companies.

One million six hundred and thirty-nine thousand cipher words of weather reports were received at and sent from this office during the year. Seventy thousand two hundred and twenty-five telegrams other than weather reports were sent and received during the same period.

On account of the reduced rates for Government telegrams, including the reports sent over circuits, the service was enabled to largely extend the dissemination of weather reports and forecasts for the benefit of the public.

## THE SEA-COAST TELEGRAPH LINES.

The telephone wire from Sandy Hook, New Jersey, to Barnegat Inlet, New Jersey, 52 miles in length, was repaired and the telephone instruments adjusted by Sergeant Bolton during July and August, 1884; the Signal Service furnishing the line material, and the Life Saving Service paying for the hired labor. This section is operated exclusively by the Life Saving Service as a telephone line.

A new single conductor submarine cable,  $3\frac{1}{2}$  miles long, was laid across Ocracoke Inlet, North Carolina, on November 29, 1884.

During November and December, 1884, the line between Fort Macon, North Carolina, and Hatteras, North Carolina, 65 miles in length, was repaired and put in as good working order as the available means would permit.

On October 1, 1884, the leased wires connecting this office directly with the sea-coast lines were given up, and since that date all sea-coast telegraphic communications have been transmitted to and from this office over the wires of the Western Union Telegraph Company.

On account of the very limited appropriation for the fiscal year ending June 30, 1885, many badly needed repairs could not be made. At present two-thirds of the entire sea-coast line needs rebuilding.

## THE UNITED STATES MILITARY TELEGRAPH LINES.

There have been but few changes in the military telegraph lines, built and operated by the Signal Service, since date of last report.

Lieut. M. P. Maus, First Infantry, was relieved by Lieut. R. B. Watkins, Signal Corps, as officer in charge of the California and Arizona division, on July 31, 1884; and Lieut. W. D. Wright, Signal Corps, was relieved from the charge of the Northwestern Division on May 31, 1885, and ordered to this office. The several detached sections constituting the Northwestern Division are now managed by the chief operators under the direct control of this office, except the Fort Sisseton-Webster line, which was equipped with telephones and turned over to the military authorities at Fort Sisseton.

The aggregate length of the military telegraph lines is now 2,779 miles, against 2,805 miles in operation at the date of the last report.

Only one new line was built during the year—that from Fort Laramie, Wyo., to Fort Robinson, Nebr. It was built by the labor of troops, who also cut the poles for the entire line—75 miles in length. The Signal Service furnished two expert line builders to direct and assist in the work, and all of the line material, which had been recovered from old abandoned lines. The line has worked without interruption since the date of its completion, April 18, 1885.

The abandonment of the military posts at Fort Thornburg, Utah, Fort Cummings, N. Mex., and Fort Craig, N. Mex., rendered the further maintenance of the telegraph lines to those posts unnecessary. The line between Forts Bridger and Thornburg was accord-

ingly abandoned November 15, 1884; that between Fort Cummings and Florida Station, August 22, 1884; and that between San Marcial, via Fort Craig, to Ojo de Analla, March 20, 1885.

To provide a new and shorter outlet for Fort Stanton, N. Mex., than that to San Marcial, a short line was built between Lava, N. Mex., and Ojo de Analla, to connect at the latter point with the line to Fort Stanton. This new line, 10 miles in length, was constructed of iron poles and other material recovered from old abandoned lines, and with the assistance of a detail from Fort Stanton. It was completed March 19, 1885.

All of the abandoned sections were sold at public auction, with the approval of the honorable Secretary of War.

The lines remaining in operation are distributed between the several military departments as follows:

	Miles.
Department of Dakota.....	893
Department of the Missouri.....	582
Departments of the Columbia and California.....	512
Department of Arizona.....	510
Department of Texas.....	197
Department of the Platte.....	85
Total.....	2,779

The accompanying map exhibits the various sections of United States military telegraph lines now in operation, and those abandoned during former years.

The following new lines have been recommended built by the respective department commanders, and will be included in the estimates for the next fiscal year, namely:

	Miles.
From Fort Gaston, Cal., to the North Fork of Mad River, California.....	28
From Fort Halleck, Nev., to Halleck Station, Nev.....	12
Total.....	40

A new line was also recommended to connect Vancouver Barracks by telephone with Portland, Oreg. The material to build it was supplied by this office, but at last accounts the line had not been built, and it was doubtful whether it would be necessary.

General repairs to sections were made as follows during the year, namely:

Between Fort Apache and Fort Bowie, Ariz., during July and August, 1884. These repairs included the construction of a new iron line between Fort Grant and Wilcox, in place of the old, crooked, wooden line.

Between Fort Stanton and Fort Craig, N. Mex., during September and October, 1884. A large number of iron poles were put up in place of wooden ones; and a sufficient number of iron poles is now on hand to replace the remaining wooden poles on this section.

Between Dayton, Wash., and Fort Lapwai, Idaho, during August and September, 1884. A large number of defective poles were shortened and reset, and the whole line put in thorough repair.

Between Ashland, Oreg., and Fort Bidwell, Cal., during August and September, 1884. Details are now in the field to replace the rotten poles on this section.

All sections in Dakota and Montana were gone over by Lieutenant Wright during the fall of 1884, and general repairs made where needed.

Between Spokane Falls, Wash., and Fort Cœur d'Alene, Idaho, general repairs were made during October, 1884.

Between Brownsville and Rio Grande City, Tex., during October, 1884.

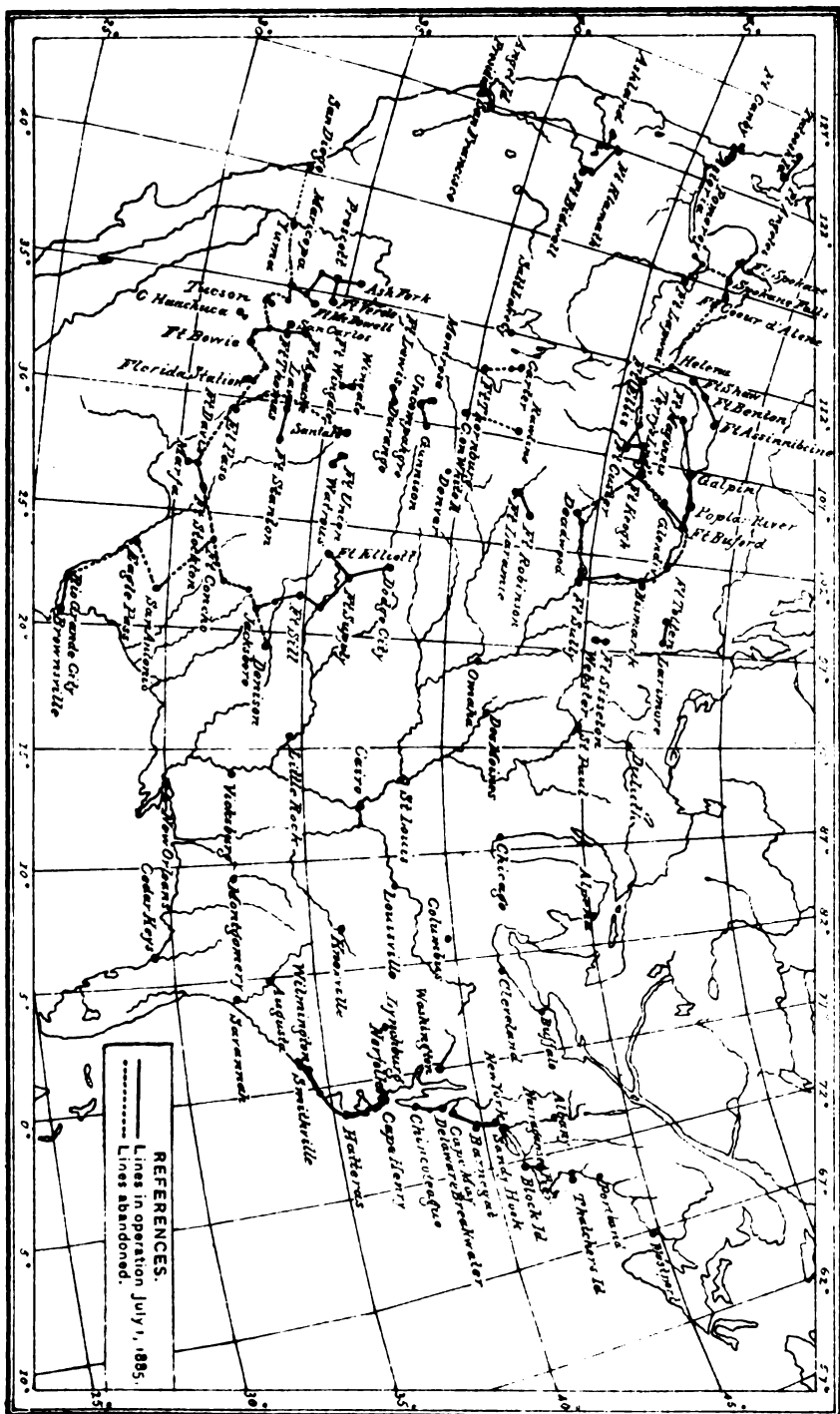
Between Helena and Fort Assinaboine, Mont., during May, 1885.

Between Fort Yates and Fort Sully, Dak., during June, 1885.

As the wooden poles on some sections have not been renewed since the lines were first built, a period of from five to eight years, it will be necessary to provide a large number of wooden or iron poles in the near future to replace the poles now rapidly going into decay.

The lines, as a whole, have worked with little more than ordinary interruptions, such as all telegraph lines are liable to. Tornadoes, floods, lightning, and malicious interference have been the principal causes of trouble. Considering that these lines run through sparsely-settled regions, where the only means of travel is by horseback or wagon, the promptness with which most repairs have been made is commendable. This is in a large measure due to the liberal assistance rendered by most department and post commanders, for whose benefit the lines are maintained. But the men detailed to make ordinary and general repairs receive no extra compensation for this arduous work. This

MAP OF U. S. MILITARY TELEGRAPH LINES.







is neither just nor conducive to that interest in and willingness to perform the work which secure the best results. The recommendation of last year that a law be obtained permitting the permanent detail of fifty enlisted men of the line of the Army for duty with the military lines, and payment of extra-duty pay to the same from line receipts, as in former years, is renewed.

Respectfully submitted.

F. M. M. BEALL,  
Second Lieutenant, Signal Corps.

*Statement showing the total cash receipts and value of free business on the United States Military telegraph lines during the year ending June 30, 1885.*

Division or section.	Cash receipts.		Value of free business.
	This line.	Other lines.	
California and Arizona division.....	\$5,894 98	\$11,143 36	\$7,817 28
Fort Davis section.....	688 19	1,115 20	960 10
Brownsville section.....	1,110 13	615 14	946 84
Fort Stanton section.....	335 38	676 08	87 20
Indian Territory section.....	1,567 96	1,880 48	2,606 45
Fort Bridger section.....	96 77	166 24	87 14
Fort Robinson section*.....	89 24	99 45	59 47
Fort Canby section.....	97 84	95 27	1,645 71
Cape Flattery section.....	111 84	318 89	2,006 67
Fort Klamath section.....	567 11	734 31	333 91
Dayton section.....	874 25	947 36	222 57
Spokane Falls section.....	436 68	333 72	661 41
Fort Maginnis section.....	317 77	1,060 28	1,516 00
Fort Assinaboine section.....	1,430 83	2,066 68	1,237 27
Fort Custer section.....	100 45	448 75	539 09
Fort Bismarck section.....	255 74	452 82	910 96
Fort Totten section.....	24 32	134 77	79 08
<b>Total.....</b>	<b>18,939 47</b>	<b>22,384 70</b>	<b>21,737 14</b>

\* For two and one-half months.

## APPENDIX 64.

## REPORT OF OFFICER IN CHARGE OF CORRESPONDENCE AND RECORDS DIVISION.

SIGNAL OFFICE, WAR DEPARTMENT,  
Washington City, August 15, 1885.

SIR: I have the honor to inclose herewith, as usually furnished by the Correspondence and Records Division, for publication in annual reports, the following, in duplicate in each case:

(1) List showing number of communications sent from and received at the Signal Office, Washington City (exclusive of telegrams), year ending June 30, 1885.

(2) List of stations inspected year ending June 30, 1885.

(3) List of places for which stations have been requested, but not established to June 30, 1885.

(4) List showing meteorological data furnished persons for purpose specified, year ending June 30, 1885.

(5) List of boards of trade, chambers of commerce, and other organizations having meteorological committees to confer with the Chief Signal Officer, June 30, 1885.

Very respectfully, your obedient servant,

B. M. PURSELL,

Second Lieutenant, Signal Corps, United States Army.

The CHIEF SIGNAL OFFICER, United States Army.

## APPENDIX 64 A.

Communications sent from and received at the Signal Office, Washington City (exclusive of telegrams), from July 1, 1884, to June 30, 1885.

## SENT.

To heads of Departments and Bureaus .....	3,932
To non-commissioned officers in charge of stations concerning their duties .....	14,110
In reply to applications for establishment of stations .....	116
To telegraph companies in reference to transmission of weather reports, the erection of telegraph lines, &c. ....	148
To boards of trade, chambers of commerce, &c. ....	235
To foreign correspondents relating to simultaneous weather reports .....	267
To foreign correspondents in general .....	1,061
To voluntary observers throughout the United States .....	5,725
Relative to enlistments, discharges, &c. ....	1,181
Relative to publications .....	1,338
Data furnished .....	294
To postmasters relative to Farmer's Bulletins, &c. ....	196
To railroad companies relative to establishing stations, furnishing indications, &c. ....	216
To Fort Myer, Virginia, concerning duties and discipline at Signal Service school of instruction .....	226
Relative to furnishing meteorological instruments, charts, books, forms, &c. ....	472
Relative to building, sale, repair, &c., of telegraph lines .....	133
To signal officers relative to their duties .....	409
Orders, circulars, instructions, &c. ....	42,600
To manufacturers and others in reference to instruments, equipments, &c. ....	9,072
To enlisted men in reference to property and money accounts .....	12,091
In reference to quarterly returns of officers, &c. ....	3,174
Authorizing purchases and expenditures .....	2,573
Miscellaneous .....	8,993
<b>Total .....</b>	<b>108,582</b>

## RECEIVED.

From heads of Departments and Bureaus.....	8, 938
Applications for establishment of new stations .....	35
From telegraph companies in reference to the transmission of weather reports and the construction of telegraph lines, &c.....	183
From boards of trade, chambers of commerce, &c.....	289
From foreign correspondents .....	7, 099
Surgeons' certificates.....	670
Examination papers .....	133
From enlisted men in reference to their duties .....	10, 516
Returns, accounts, descriptive lists, &c.....	1, 301
From United States naval stations and vessels .....	1, 932
From voluntary observers throughout the United States .....	3, 991
From United States military posts (surgeons' reports) .....	574
Relating to duties and discipline at Signal Service school of instruction at Fort Myer, Virginia.....	251
Relating to instruction in military signaling.....	77
Applications for enlistment.....	574
Instruction reports .....	2, 167
Reports from railroad stations in reference to weather reports .....	20, 507
Meteorological forms, &c., from stations .....	213, 182
Reports from postmasters in reference to weather bulletins .....	103, 952
Acknowledgments of orders, circulars, &c.....	17, 000
From manufacturers and others in reference to instruments, equipments, &c.....	5, 253
From officers concerning property, quarterly returns, &c.....	5, 856
From enlisted men relating to property and money accounts .....	24, 917
Miscellaneous .....	10, 730
Total .....	438, 127
Total sent.....	108, 582
Total sent and received .....	546, 709

## TELEGRAMS.

Cipher words of weather reports sent and received .....	1, 639, 000
Telegrams other than weather reports sent and received .....	70, 225

## APPENDIX 64 B.

Stations inspected year ending June 30, 1885.

Station.	Inspected by—	Date of inspection.
Albany, N. Y.....	Lieut. F. R. Day, Signal Corps, U. S. A.....	March 29, 30, 1885.
Alpena, Mich.....	do.....	April 24, 1885.
Apache, Fort, Ariz.....	Lieut. R. B. Watkins, Signal Corps, U. S. A.....	November 11, 12, 1884.
Azsinaboline, Fort, Mont.....	Lieut. W. D. Wright, Signal Corps, U. S. A.....	November 11, 12, 1884.
Atlanta, Ga.....	Lieut. J. C. Walshe, Signal Corps, U. S. A.....	March 20, 21, 1885.
Augusta, Ga.....	do.....	March 22, 23, 1885.
Baltimore, Md.....	Lieut. J. P. Finley, Signal Corps, U. S. A.....	March 9, 10, 1885.
Bennett, Fort, Dak.....	Lieut. W. D. Wright, Signal Corps, U. S. A.....	September 28, 1884.
Benton, Fort, Mont.....	do.....	November 9, 1884.
Bidwell, Fort, Cal.....	Lieut. Frank Greene, Signal Corps, U. S. A.....	July 17, 1884.
Bismarck, Dak.....	Lieut. W. D. Wright, Signal Corps, U. S. A.....	January 6-8, 1885.
Block Island, R. I.....	Lieut. F. R. Day, Signal Corps, U. S. A.....	March 12, 13, 1885.
Boise City, Idaho.....	Lieut. Frank Greene, Signal Corps, U. S. A.....	July 14, 1884.
Bowie, Fort, Ariz.....	Lieut. R. B. Watkins, Signal Corps, U. S. A.....	October 24, 1884.
Boston, Mass.....	Lieut. F. R. Day, Signal Corps, U. S. A.....	March 15-19, 1885.
Buffalo, N. Y.....	do.....	April 8, 9, 1885.
Brownsville, Tex.....	Lieut. W. A. Glassford, Signal Corps, U. S. A.....	March 14, 15, 1885.
Buford, Fort, Dak.....	Lieut. W. D. Wright, Signal Corps, U. S. A.....	October 13, 1884.
Burlington, Iowa.....	Lieut. J. P. Finley, Signal Corps, U. S. A.....	May 7, 8, 1885.
Cape Mendocino, Cal.....	Lieut. Frank Greene, Signal Corps, U. S. A.....	July 29-31, 1884.
Cape Henry, Va.....	Lieut. J. C. Walshe, Signal Corps, U. S. A.....	March 5, 6, 1885.
Calro, Ill.....	do.....	May 8, 9, 1885.
Cape Lookout, N. C.....	do.....	May 27, 28, 1885.

*Stations inspected year ending June 30, 1885—Continued.*

Station.	Inspected by—	Date of inspection.
Cedar Keys, Fla.	Lieut. J. C. Walshe, Signal Corps, U. S. A.	April 1-3, 1885.
Charlotte, N. C.	do	March 17, 18, 1885.
Chattanooga, Tenn.	do	May 12, 13, 1885.
Cheyenne, Wyo.	Lieut. J. P. Finley, Signal Corps, U. S. A.	April 20-23, 1885.
Chicago, Ill.	Lieut. F. R. Day, Signal Corps, U. S. A.	May 11-13, 1885.
Charleston, S. C.	Lieut. J. C. Walshe, Signal Corps, U. S. A.	March 24-26, 1885.
Cincinnati, Ohio.	Lieut. J. P. Finley, Signal Corps, U. S. A.	March 18, 19, 1885.
Cleveland, Ohio.	Lieut. F. R. Day, Signal Corps, U. S. A.	April 11-13, 1885.
Concho, Fort, Tex.	Lieut. W. A. Glassford, Signal Corps, U. S. A.	February 13-15, 1885.
Custer, Fort, Ariz.	Lieut. W. D. Wright, Signal Corps, U. S. A.	October 30, 31, 1884.
Columbus, Ohio.	Lieut. J. P. Finley, Signal Corps, U. S. A.	March 15-17, 1885.
Colorado Springs, Colo.	do	April 10-17, 1885.
Craig, Fort, N. Mex.	Lieut. R. B. Watkins, Signal Corps, U. S. A.	November 2, 1884.
Davis, Fort, Tex., and Marfa.	Lieut. W. A. Glassford, Signal Corps, U. S. A.	February 23-27, 1885.
Davenport, Iowa.	Lieut. J. P. Finley, Signal Corps, U. S. A.	May 2-4, 1885.
Deadwood, Dak.	Lieut. W. D. Wright, Signal Corps, U. S. A.	October 6, 1884.
Des Moines, Iowa.	Lieut. J. P. Finley, Signal Corps, U. S. A.	April 30 to May 2, 1885.
Detroit, Mich.	Lieut. F. R. Day, Signal Corps, U. S. A.	April 16, 17, 1885.
Denver, Colo.	Lieut. J. P. Finley, Signal Corps, U. S. A.	April 17-20, 1885.
Dodge City, Kans.	Lieut. W. A. Glassford, Signal Corps, U. S. A.	April 23, 28, 1885.
Dubuque, Iowa.	Lieut. J. P. Finley, Signal Corps, U. S. A.	May 5-7, 1885.
Duluth, Minn.	Lieut. F. R. Day, Signal Corps, U. S. A.	May 7, 8, 1885.
El Paso, Tex.	Lieut. W. A. Glassford, Signal Corps, U. S. A.	February 6-10, 1885.
Erie, Pa.	Lieut. F. R. Day, Signal Corps, U. S. A.	April 10, 1885.
Escanaba, Mich.	do	May 1, 2, 1885.
Elliott, Fort, Tex.	Lieut. W. A. Glassford, Signal Corps, U. S. A.	April 22, 23, 1885.
Glendive, Mont.	Lieut. W. D. Wright, Signal Corps, U. S. A.	October 10, 1884.
Grant, Fort, Ariz.	Lieut. R. B. Watkins, Signal Corps, U. S. A.	October 25, 26, 1884.
Greencastle, Ind.	Lieut. J. P. Finley, Signal Corps, U. S. A.	March 24, 25, 1885.
Galveston, Tex.	Lieut. W. A. Glassford, Signal Corps, U. S. A.	March 25-28, 1885.
Grand Haven, Mich.	Lieut. F. R. Day, Signal Corps, U. S. A.	May 14, 1885.
Helena, Mont.	Lieut. W. D. Wright, Signal Corps, U. S. A.	November 3-19, 1884.
Huron, Dak.	do	December 16, 17, 1884.
Hatteras, N. C.	Lieut. J. C. Walshe, Signal Corps, U. S. A.	May 23-25, 1885.
Indianapolis, Ind.	Lieut. J. P. Finley, Signal Corps, U. S. A.	March 22-24, 1885.
Indianola, Tex.	Lieut. W. A. Glassford, Signal Corps, U. S. A.	March 22-24, 1885.
Jacksonville, Fla.	Lieut. J. C. Walshe, Signal Corps, U. S. A.	March 29-31, 1885.
Key West, Fla.	do	April 9-11, 1885.
Keokuk, Iowa.	Lieut. J. P. Finley, Signal Corps, U. S. A.	May 8-10, 1885.
Knoxville, Tenn.	Lieut. J. C. Walshe, Signal Corps, U. S. A.	May 14, 15, 1885.
Kitty Hawk, N. C.	do	May 20, 21, 1885.
Los Angeles, Cal.	Lieut. R. B. Watkins, Signal Corps, U. S. A.	October 1, 2, 1884.
Louisville, Ky.	Lieut. J. P. Finley, Signal Corps, U. S. A.	March 19-21, 1885.
Leavenworth, Kans.	do	March 30, April 1-3, 1885.
Lamar, Mo.	Lieut. W. A. Glassford, Signal Corps, U. S. A.	May 1, 2, 1885.
La Crosse, Wis.	Lieut. F. R. Day, Signal Corps, U. S. A.	May 5, 1885.
Little Rock, Ark.	Lieut. W. A. Glassford, Signal Corps, U. S. A.	May 7-9, 1885.
Lynchburg, Va.	Lieut. J. C. Walshe, Signal Corps, U. S. A.	May 16, 17, 1885.
Maricopa, Ariz.	Lieut. R. B. Watkins, Signal Corps, U. S. A.	September 28, 1884.
McDowell Fort, Ariz.	do	September 26, 1884.
Maginnis Fort, Mont.	Lieut. W. D. Wright, Signal Corps, U. S. A.	October 24-26, 1884.
Moorhead, Minn.	Lieut. W. D. Wright, Signal Corps, U. S. A.	December 2, 3, 1884.
Mount Washington, N. H.	Lieut. F. R. Day, Signal Corps, U. S. A.	March 22, 23, 1885.
Montgomery, Ala.	Lieut. J. C. Walshe, Signal Corps, U. S. A.	April 19-21, 1885.
Mobile, Ala.	do	April 23-24, 1885.
Mackinaw City, Mich.	Lieut. F. R. Day, Signal Corps, U. S. A.	April 28, 1885.
Marquette, Mich.	do	April 30, May 1, 1885.
Milwaukee, Wis.	do	May 3, 4, 1885.
Memphis, Tenn.	Lieut. J. C. Walshe, Signal Corps, U. S. A.	May 5-7, 1885.
Macon, Fort, N. C.	do	May 28, 29, 1885.
New York City.	Lieut. F. R. Day, Signal Corps, U. S. A.	March 3-5, 1885.
Norfolk, Va.	Lieut. J. C. Walshe, Signal Corps, U. S. A.	March 3, 4, 1885.
New Haven, Conn.	Lieut. F. R. Day, Signal Corps, U. S. A.	March 7-9, 1885.
New London, Conn.	do	March 9, 10, 1885.
Narragansett Pier, R. I.	do	March 11, 1885.
New River Inlet, N. C.	Lieut. J. C. Walshe, Signal Corps, U. S. A.	March 12-14, 1885.
North Platte, Nebr.	Lieut. J. P. Finley, Signal Corps, U. S. A.	April 23-25, 1885.
New Orleans, La.	Lieut. J. C. Walshe, Signal Corps, U. S. A.	April 25-28, 1885.
New Orleans, La. (exposition building).	do	April 29, 30, 1885.
Nashville, Tenn.	do	May 10, 11, 1885.
Oswego, N. Y.	Lieut. F. R. Day, Signal Corps, U. S. A.	March 31, April 1, 1885.
Omaha, Nebr.	Lieut. J. P. Finley, Signal Corps, U. S. A.	April 23-30, 1885.
Poplar River, Mont.	Lieut. W. D. Wright, Signal Corps, U. S. A.	October 15, 1884.
Phoenix, Ariz.	Lieut. R. B. Watkins, Signal Corps, U. S. A.	September 26, 1884.
Prescott, Ariz.	do	November 21, 22, 1884.
Point Judith, R. I.	Lieut. F. R. Day, Signal Corps, U. S. A.	March 11, 1885.
Pittsburg, Pa.	Lieut. J. P. Finley, Signal Corps, U. S. A.	March 12, 13, 1885.
Portland, Me.	Lieut. F. R. Day, Signal Corps, U. S. A.	March 26, 27, 1885.
Pensacola, Fla.	Lieut. J. C. Walshe, Signal Corps, U. S. A.	April 16, 17, 1885.
Port Huron, Mich.	Lieut. F. R. Day, Signal Corps, U. S. A.	April 20, 21, 1885.
Pike's Peak, Colo.	Lieut. J. P. Finley, Signal Corps, U. S. A.	April 10-17, 1885.

*Stations inspected year ending June 30, 1885—Continued.*

Station.	Inspected by—	Date of inspection.
Portsmouth, N. C.....	Lieut. J. C. Walshe, Signal Corps, U. S. A.....	May 25, 26, 1885.
Palestine, Tex.....	Lieut. W. A. Glassford, Signal Corps, U. S. A.....	March 30, 31, 1885.
Red Bluff, Cal.....	Lieut. Frank Greene, Signal Corps, U. S. A.....	August 5-7, 1884.
Rio Grande City, Tex.....	Lieut. W. A. Glassford, Signal Corps, U. S. A.....	March 11, 12, 1885.
Rochester, N. Y.....	Lieut. F. R. Day, Signal Corps, U. S. A.....	April 2, 3, 1885.
Reno, Fort, Ind. T.....	Lieut. W. A. Glassford, Signal Corps, U. S. A.....	April 13, 14, 1885.
Salt Lake City, Utah.....	Lieut. Frank Greene, Signal Corps, U. S. A.....	July 9-11, 1884.
Sacramento, Cal.....	do.....	July 21, 22, 1884.
Sully, Fort, Dak.....	Lieut. W. D. Wright, Signal Corps, U. S. A.....	September 26, 1884.
San Diego, Cal.....	Lieut. R. B. Watkins, Signal Corps, U. S. A.....	October 3, 1884.
San Carlos, Ariz.....	do.....	October 29, 1884.
San Marcial N. Mex.....	do.....	November 2, 1884.
Stanton, Fort, N. Mex.....	do.....	November 5, 6, 1885.
Shaw, Fort, Mont.....	Lieut. W. D. Wright, Signal Corps, U. S. A.....	November 7, 1884.
Saint Vincent, Minn.....	do.....	December 4, 6, 1884.
Sisseton, Fort, Dak.....	do.....	December 14, 1884.
Santa Fe, N. Mex.....	Lieut. W. A. Glassford, Signal Corps, U. S. A.....	January 30, 31, February 1, 2, 1885.
Stockton, Fort, Tex.....	do.....	February 19-21, 1885.
Smithville, N. C.....	Lieut. J. C. Walshe, Signal Corps, U. S. A.....	March 9, 10, 1885.
San Antonio, Tex.....	Lieut. W. A. Glassford, Signal Corps, U. S. A.....	March 3-6, 1885.
Scott's Hill, N. C.....	Lieut. J. C. Walshe, Signal Corps, U. S. A.....	March 11, 12, 1885.
Saint Louis, Mo.....	Lieut. J. P. Finley, Signal Corps, U. S. A.....	March 26-29, 1885.
Savannah, Ga.....	Lieut. J. C. Walshe, Signal Corps, U. S. A.....	March 27-29, 1885.
Shreveport, La.....	Lieut. W. A. Glassford, Signal Corps, U. S. A.....	April 2, 3, 1885.
Sanford, Fla.....	Lieut. J. C. Walshe, Signal Corps, U. S. A.....	April 5, 6, 1885.
Sill, Fort, Ind. T.....	Lieut. W. A. Glassford, Signal Corps, U. S. A.....	April 7-9, 1885.
Sandusky, Ohio.....	Lieut. F. R. Day, Signal Corps, U. S. A.....	April 13, 14, 1885.
Supply, Fort, Ind. T.....	Lieut. W. A. Glassford, Signal Corps, U. S. A.....	April 20, 1885.
Saint Paul, Minn.....	Lieut. F. R. Day, Signal Corps, U. S. A.....	May 6, 1885.
Smith, Fort, Ark.....	Lieut. W. A. Glassford, Signal Corps, U. S. A.....	May 5, 6, 1885.
Springfield, Ill.....	Lieut. J. P. Finley, Signal Corps, U. S. A.....	May 12-14, 1885.
Terry's Landing, Mont.....	Lieut. W. D. Wright, Signal Corps, U. S. A.....	October 21, 1884.
Thomas, Fort, Ariz.....	Lieut. R. B. Watkins, Signal Corps, U. S. A.....	October 27, 28, 1884.
Totter, Fort, Dak.....	Lieut. W. D. Wright, Signal Corps, U. S. A.....	December 8, 1884.
Toledo, Ohio.....	Lieut. F. R. Day, Signal Corps, U. S. A.....	April 14, 15, 1885.
Verde, Fort, Ariz.....	Lieut. R. B. Watkins, Signal Corps, U. S. A.....	September 22, 1884.
Wicksburg, Miss.....	Lieut. J. C. Walshe, Signal Corps, U. S. A.....	May 2-4, 1885.
Wickenburg, Ariz.....	Lieut. R. B. Watkins, Signal Corps, U. S. A.....	September 25, 1884.
Willcox, Ariz.....	do.....	October 23, 1884.
Watrous, N. Mex.....	Lieut. W. A. Glassford, Signal Corps, U. S. A.....	January 27, 1885.
Wilmington, N. C.....	Lieut. J. C. Walshe, Signal Corps, U. S. A.....	March 7-9, 1885.
West Las Animas, Colo.....	Lieut. J. P. Finley, Signal Corps, U. S. A.....	April 7-10, 1885.
Yates, Fort, Dak.....	Lieut. W. D. Wright, Signal Corps, U. S. A.....	September 15, 1884.
Yuma, Fort, Ariz.....	Lieut. R. B. Watkins, Signal Corps, U. S. A.....	September 29-30, 1884.
Yankton, Dak.....	Lieut. W. D. Wright, Signal Corps, U. S. A.....	December 19, 1884.

## APPENDIX 64 c.

*List of places for which stations have been requested but not established to June 30, 1885.*

Place.	Date.	Place.	Date.
Alabama:		California:	
Auburn (Agricultural and Mechanical College).....	May 14, 1872	Bakersfield.....	May 14, 1874
	Dec. 23, 1880	Cheyenne Wells.....	July 27, 1877
	Jan. 4, 1881	Oakland (University of California).....	Mar. 12, 1881
Coffeeville.....	Dec. 20, 1882		Apr. 15, 1884
Eutaw.....	July 20, 1872		Apr. 5, 1885
Florence.....	Apr. 20, 1880	Table Mountain.....	Oct. 4, 1883
Friendville.....	Nov. 6, 1875	Tulose.....	June 29, 1884
Marion.....	Oct. 16, 1881	Wilmington.....	Jan. 4, 1881
Trinity.....	Mar. 4, 1882	Colorado:	
Arkansas:		Fountain.....	Dec. 4, 1871
Fayetteville (Arkansas Industrial University).....	Feb. 17, 1874	Leadville.....	June 17, 1880
	Sept. 28, 1881		Feb. 9, 1881
Fulton.....	Dec. 23, 1875	Mount Massive.....	Feb. 23, 1883
	Dec. 21, 1879	Summit.....	Jan. 7, 1880
Hot Springs.....	Aug. 2, 1881	The Parks of Colorado.....	May 24, 1871
	Dec. 10, 1877	Connecticut:	
Indsonia University.....	Aug. 18, 1877	Hartford.....	Jan. 21, 1875
	July 6, 1878	Mohawk Mountain.....	Oct. 14, 1882
		Race Rock Light-house.....	Nov. 20, 1880



*List of places for which stations have been requested, &c.—Continued.*

Place.	Date.	Place.	Date.
<b>Michigan—Continued.</b>		<b>New Mexico:</b>	
Lansing (State Agricultural College).....	Jan. 12, 1875	Cimarron.....	Dec. 3, 1880
Leland.....	Dec. 18, 1883	<b>New York:</b>	
Manitou Island.....	Dec. 22, 1884	Alfred Centre (Alfred University).....	Jan. 12, 1877
Niles.....	Feb. 25, 1882	Catskill Mountains.....	June 21, 1883
Paw-Paw.....	Oct. 24, 1881	Deposit.....	Apr. 1, 1872
Port Hope.....	July 27, 1881	Ithaca (Cornell University).....	Aug. 3, 1872
Three Rivers.....	Apr. 8, 1876		Nov. 18, 1872
White Hall.....	July 22, 1871		Nov. 22, 1872
	May 30, 1873		Jan. 25, 1873
	Mar. 29, 1879		Jan. 3, 1875
	Oct. 6, 1879		Mar. 17, 1875
<b>Minnesota:</b>			Apr. 17, 1875
Breckinridge.....	Feb. 17, 1881		May 7, 1878
Detroit.....	Feb. 2, 1873		Aug. 8, 1878
Minneapolis (University of Minnesota).....	Feb. 21, 1872		Oct. 16, 1880
Minneka.....	Mar. 16, 1885	Long Beach (Long Island).....	May 25, 1872
New Ulm.....	July 10, 1872	Ogdensburg.....	Mar. 7, 1879
	Dec. 15, 1881	Overlook Mountains.....	May 28, 1872
Northfield (Carleton College).....	May 28, 1879	Port Jervis.....	Nov. 8, 1881
	Nov. 19, 1880	Saratoga Springs.....	Aug. 23, 1884
Reed's Landing.....	June 25, 1877	Sodus Point.....	Feb. 14, 1883
<b>Mississippi:</b>		Starkey.....	Aug. 8, 1878
Chatawa (College of the Redemptionist Fathers).....	July 13, 1874	Staten Island.....	June 9, 1871
Iuka.....	Mar. 25, 1872		June 20, 1871
Macon.....	Jan. 9, 1881	Suspension Bridge (Seminary of our Lady of Angels).....	May 14, 1880
Starkville.....	June 25, 1884	Syracuse.....	May 9, 1874
Winona.....	July 20, 1882		May 11, 1874
Agricultural and Mechanical College.....	June 19, 1885	The Vista (Catskill Mountains).....	Feb. 6, 1878
<b>Missouri:</b>		Ticonderoga.....	Feb. 21, 1882
Brunswick.....	June 4, 1885	Watertown.....	June 21, 1871
Carthage.....	Aug. 15, 1873		June 21, 1873
Dromore.....	Jan. 27, 1883		Mar. 9, 1876
Glasgow.....	Mar. 8, 1880	Whitestone (Long Island).....	Dec. 29, 1881
Killingham.....	Mar. 21, 1884	<b>North Carolina:</b>	
Louisiana.....	Aug. 31, 1871	Alleghany Mountains.....	July 26, 1873
	Jan. 4, 1882	Asheville.....	May 13, 1885
Mason City.....	Mar. 30, 1874	Beaufort.....	Feb. 15, 1881
Pierce City.....	Apr. 9, 1873		July 24, 1882
	Nov. 10, 1880		Feb. 12, 1872
	Feb. 17, 1885	Black Dome (Black Mountains).....	Dec. 10, 1880
	May 5, 1880		Jan. 28, 1881
Rolla (Missouri School of Mines).....	July 17, 1876	Body Island.....	Apr. 17, 1871
Saint Joseph (University of Missouri).....	Jan. 22, 1882	Chadbourne.....	July 4, 1883
	Mar. 15, 1883	Danville (Mocksville and Southwestern Railroad).....	July 29, 1881
Saint Louis (College of the Christian Brothers).....	Mar. 12, 1884	Great Natehalee (Bald Mountains).....	Apr. 1, 1872
Springfield.....	Feb. 9, 1884	Hibritten Mountains.....	Jan. 28, 1881
West Plains.....	Aug.—, 1884	Highlands.....	Dec. 13, 1881
<b>Montana:</b>			Dec. 29, 1881
Bedford.....	Apr. 10, 1881		Dec. 30, 1881
Butte.....	Oct. 11, 1879		Feb. 12, 1884
Etchetah.....	Oct. 21, 1881		July 23, 1875
Livingston.....	Mar. 15, 1883	Lenoir.....	Aug. 29, 1878
Missoula.....	June 26, 1882	Mount Mitchell.....	Oct. 19, 1882
Wolf Point.....	June 16, 1882	Mount Stookey.....	June 29, 1877
<b>Nebraska:</b>		Ocracoke.....	July 19, 1878
Beatrice.....	Mar. 3, 1874	Roane Mountain.....	Mar. 14, 1885
Columbus.....	Sept. 5, 1871	Smead's Ferry.....	Nov. 17, 1877
Fairbury.....	May 12, 1876	Statesville.....	Jan. 29, 1879
Lincoln.....	Mar. 4, 1884	Swansborough.....	Sept. 4, 1879
Nebraska City.....	Aug. 14, 1874	Winston.....	Mar. 17, 1880
<b>Nevada:</b>		<b>Ohio:</b>	
Carson City.....	Mar. 6, 1876	Dayton (National Soldiers' Home).....	Feb. 11, 1873
<b>New Jersey:</b>			Feb. 1, 1875
Camden (The River Iron Works).....	July 29, 1874	Gallipolis.....	Feb. 10, 1885
Neshanic Mountains (Somerset County).....	Apr. 12, 1873	Hillsborough.....	Sept. 3, 1881
Somerset County (latitude, 40° 30'; longitude 74° 42').....	Dec. 22, 1873	Ironton.....	Mar. 25, 1875
<b>New Hampshire:</b>		Kelly's Island.....	May 25, 1876
Dover Point.....	Jan. 13, 1872		Dec. 17, 1879
Gorham.....	Mar. 30, 1874		Aug. 19, 1880
Isles of Shoals.....	Sept. 10, 1879	Oxford.....	Feb. 22, 1882
Manchester.....	Jan. 21, 1873		Aug. 5, 1882
Milton.....	Jan. 8, 1883	Springfield.....	Feb. 7, 1881
Mount Kearsarge.....	Oct. 28, 1874	University of Ohio, Columbus.....	June 23, 1885
Mount Massilank.....	Aug. 16, 1871	Xenia.....	June 30, 1871
		Yellow Springs.....	Feb. 4, 1885

*List of places for which stations have been requested, &c.—Continued.*

Place.	Date.	Place.	Date.
<b>Oregon:</b>		<b>Vermont—Continued.</b>	
Baker City.....	Feb. 9, 1876	Bennington (Mount Anthony)...	Jan. 27, 1875
Corvallis.....	Jan. 17, 1884	Burlington.....	July 1, 1884
Point Adams.....	Aug. 26, 1880	Northfield (Norwich University).....	Mar. 15, 1872
Tillamook Rock.....	Aug. 26, 1880	Mount Killington.....	Dec. 17, 1884
	Dec. 27, 1880	Mount Mansfield.....	Dec. 25, 1884
	Jan. 3, 1881	Randolph (State Normal School).....	Mar. 14, 1881
	June 20, 1881	Stowe.....	Dec. 22, 1876
	Jan. 31, 1882	<b>Virginia:</b>	
	Mar. 8, 1882	Bald Knob (Giles County).....	July 21, 1874
<b>Pennsylvania:</b>			Dec. 22, 1876
Altoona.....	Feb. 17, 1872	Blacksburg.....	Dec. 22, 1883
Berks (summit of Blue Ridge Mountains).....	Sept. 9, 1881	Charlottesville (University of Virginia).....	Mar. 2, 1873
Carlisle.....	May 4, 1876	Christianburg.....	Aug. 15, 1871
Catasauqua.....	Sept. 11, 1871	Danville.....	Dec. 13, 1875
Chambersburg.....	June 12, 1871		July 15, 1879
Cresson.....	Jan. 10, 1885		May 23, 1882
Easton.....	Aug. 15, 1871	Elliott's Knob.....	May 23, 1879
Franklinville.....	Dec. 1, 1882	Manassas.....	Dec. 27, 1871
Gallatin.....	Feb. 17, 1872	Mountains (additional stations on).....	May 17, 1871
Greensborough.....	Dec. 28, 1872	Mount Lake.....	July 21, 1874
	Jan. 10, 1873	Richmond.....	Apr. 3, 1871
Harrisburg.....	Aug. 15, 1871	Staunton.....	Aug. 15, 1871
	Feb. 26, 1881		Oct. 9, 1882
	Oct. 29, 1881	Winchester.....	Aug. 15, 1871
Heilmandale.....	Apr. 1, 1872	<b>Washington Territory:</b>	
Hummelstown.....	June 10, 1879	Cape Disappointment.....	Sept. 30, 1873
Kutztown (Keystone State Normal School).....	Sept. 13, 1872		Dec. 9, 1881
Locust Mountain.....	Nov. 20, 1884	Cape Hancock.....	Feb. 12, 1882
Media.....	Oct. 1, 1883	Port Townsend.....	Mar. 8, 1873
Mount Pisgah (Bradford County).....	Mar. 2, 1875		Dec. 16, 1878
Mount Pleasant (Mount Pleasant Academy).....	Aug. 11, 1871		Dec. 17, 1878
Tionesta.....	Feb. 9, 1884		Mar. 5, 1880
Wilkesbarre.....	Apr. 3, 1881		Oct. 26, 1878
<b>South Carolina:</b>		Seattle.....	No date
Aiken.....	July 16, 1872	Semiahmoo.....	Feb. 9, 1876
	Sept. 2, 1872	Walla Walla.....	
	Mar. 31, 1875	<b>West Virginia:</b>	
	Aug. 22, 1884	Corado.....	June 10, 1876
Georgetown.....	No date.		Nov. 21, 1876
Laurens.....		Maywood.....	Oct. 15, 1883
<b>Tennessee:</b>		<b>Wisconsin:</b>	
Bristol.....	Aug. 15, 1871	Bailey's Harbor.....	Feb. 16, 1883
Clarksville.....	Dec. 21, 1881		Apr. 16, 1882
Moffat.....	June 29, 1876		Jan. 8, 1883
Sewanee (University of the South).....	June 10, 1872		Mar. 25, 1885
	June 26, 1877	Carlton.....	Jan. 10, 1874
	Apr. 22, 1881		Jan. 26, 1874
	Dec. 17, 1881	Fond du Lac.....	Dec. 15, 1874
	Oct. 17, 1884	Hingham.....	Apr. 19, 1875
Tennessee Ridge.....	June 13, 1883	Janesville.....	Aug. 7, 1881
<b>Texas:</b>		Mineral Point.....	Dec. 1, 1873
Ablene.....	Feb. 26, 1884	Oshkosh.....	Jan. 22, 1875
Belton.....	May 28, 1879	Palmyra.....	May 19, 1874
Caddo Peak.....	Nov. 28, 1883	Prairie du Chien.....	Feb. 27, 1884
Comfort.....	Sept. 2, 1880	Ripon (Ripon College).....	July 21, 1877
	Sept. 6, 1880		Feb. 5, 1878
	Nov. 15, 1880		Feb. 29, 1878
Corpus Christi.....	Mar. 24, 1885	<b>Wyoming:</b>	
Fort Worth.....	May 25, 1881	Fred Steele, Fort.....	Feb. 24, 1881
Galveston (north and west of).....	Mar. 6, 1873	<b>Miscellaneous:</b>	
Lampasas.....	Feb. 14, 1883	Atlantic Ocean.....	Aug. 12, 1882
San Antonio.....	July 1, 1884	Chippewyan, Fort (Canada).....	Sept. 11, 1882
<b>Utah:</b>		Havana, Cuba.....	Sept. 14, 1882
Beaver City.....	July 8, 1872	Prince Albert (North Saskatchewan River, Manitoba).....	Aug. 31, 1882
Ogden.....	Apr. 26, 1879	State Agricultural College.....	Feb. 29, 1872
<b>Vermont:</b>			
Ascutney Mountain.....	May 24, 1881		



## APPENDIX 64 D.

Meteorological data were furnished 208 different persons during the year ending June 30, 1885, at their request, for the following purposes, viz:

To be used in State or United States courts as evidence.

To be used in compiling works or publications on meteorology, hygiene, agriculture, manufactures, commerce, &c.

To assist in manufactures, the prosecution of the arts, and advancement of the sciences.

To settle questions as to the relations of meteorology and agriculture.

In deciding the cause and locating the responsibility in railroad and marine disasters.

In fixing the responsibility of damage to freight in transit by common carriers.

In acquainting immigrants with the climatology of districts open to settlement.

In informing invalids of the desirability of the meteorology of sections affecting their diseases.

Miscellaneous purposes.

## APPENDIX 64 E.

*List of boards of trade, chambers of commerce, and other organizations which had on June 30, 1885, meteorological committees to confer with the Chief Signal Officer of the Army.*

Place.	Name of organization.	Committee.
Albany, N. Y .....	Board of Trade.....	Charles B. Tillinghast, J. Townsend Lansing, Walter McEwan.
Alpena, Mich.....	Board of Underwriters.....	Henry S. Seage, John N. Kelley, J. D. Holmes, B. F. Luce, Charles H. Luce.
Astoria, Oreg.....	Chamber of Commerce.....	Dr. A. C. Kinney.
Atlanta, Ga.....	Board of Trade and Academy of Science.	B. W. Frobel, J. T. Henderson, R. J. Redding.
Augusta, Ga.....	Cotton Exchange.....	G. W. Crane, J. M. Anderson, J. J. Dicks.
Baltimore, Md .....	Board of Trade.....	George J. Appold, D. L. Bartlett, Germon H. Hunt, Frank H. Jenkins, D. T. Buzby.
Block Island, R. I.....	.....	B. B. Mitchell, Ray S. Littlefield, Charles E. Perry.
Boston, Mass.....	Society of Arts.....	Prof. William H. Niles, Jacob A. Dresser, George L. Roberts.
Buffalo, N. Y .....	Merchants' Exchange.....	Nathan C. Simons, Frank W. Fiske, Charles H. Arthur.
Charleston, S. C.....	Chamber of Commerce.....	C. Gravely, F. W. Dawson, A. D. Cohen.
Do.....	Merchants' Exchange.....	George W. Bell, T. Follett Ware, John Dougherty.
Charlotte, N. C.....	Chamber of Commerce.....	T. F. Drayton, S. A. Cohen, W. W. Flemming.
Chattanooga, Tenn.....	Iron, Coal, and Manufacturers' Association.	D. W. Chase, J. F. Bennett, A. M. Johnson, S. R. Read, C. E. James, T. A. Snow, G. G. Moore.
Chicago, Ill.....	Board of Trade.....	W. S. Seavers, W. D. Gregory.
Cincinnati, Ohio.....	Board of Trade and Transportation Committee.	T. E. Livezey, George C. Clements, Charles H. Law, Alexander Hill, A. M. Dolph.
Cleveland, Ohio.....	Board of Trade.....	R. T. Lyon, Capt. W. B. Guyles, R. K. Winslow.
Columbus, Ohio.....	Board of Trade.....	George W. Twiss, George Cole, J. B. K. Conelly.
Concordia, Kans.....	.....	B. H. McEckron, Theo. Laing, Prof. T. A. Sawhill.
Denver, Colo.....	Chamber of Commerce.....	Charles F. Wilson, Ed. L. Scholtz, J. B. Reverdy, Samuel A. Fiek, M. D.; L. E. Lemon, M. D.; J. H. Kimball.
Des Moines, Iowa.....	Board of Trade.....	J. P. Bushnell, secretary; S. A. Robertson, W. A. Warfield.
Detroit, Mich.....	Board of Trade.....	T. P. Hall, J. W. Flynn.
Dubuque, Iowa.....	Board of Trade.....	Dr. A. Horr, T. W. Ruete, S. M. Langworthy.
Duluth, Minn.....	Board of Trade.....	Walter Van Brunt, Owen Fargueson, Benj. R. Clarkson.
Erie, Pa.....	Board of Trade.....	H. S. Jones, Jos. Johnston, Charles Jarecki.
Grand Haven, Mich.....	.....	Hon. Dwight Cutler, T. W. Kirby, William Wallace.
Huron, Dak.....	Board of Trade.....	John Cain, Augustine Dovia, Hon. Geo. W. Sterling.
Indianapolis, Ind.....	Board of Trade.....	George W. Sloan, A. J. Halford, James R. Carnehan.
Indianola, Tex.....	Board of Trade.....	H. J. Huck, Emile Reiffert.

*List of boards of trade, chambers of commerce, and other organizations, &c.—Continued.*

Place.	Name of organization.	Committee.
Jacksonville, Fla.....	Jacksonville Board of Trade.	Dr. A. S. Baldwin, Reed, Clark, Bower, Fuerite.
La Crosse, Wis.....	Board of Trade.....	D. A. McDonald, John Rau, J. H. Sherman.
Leavenworth, Kans.....	Board of Trade.....	Dr. R. J. Brown, Judge L. Hawn, L. Mayo.
Los Angeles, Cal.....	Los Angeles Board of Trade.	Eugene Germain, Vinton L. Mitchell, W. A. Clinton.
Louisville, Ky.....	Board of Trade.....	William Cornwall, jr., J. B. Speed, Graham Wilder, J. A. Tanner, E. H. Bowen, Nick Finzer, R. M. Kelly.
Do.....	Polytechnic Society.....	E. A. Grant, M. D., LL. D.; Prof. J. A. Tanner, M. D.; Prof. H. W. Eaton, Ph. D.
Lynchburg, Va.....	Chamber of Commerce.....	R. H. T. Adams, Joseph Cohn, William Hunt.
Memphis, Tenn.....	Cotton Exchange.....	D. P. Hadden, John D. Milburn, J. J. Freeman, H. A. Hamilton, M. Gavin, James Yonge, L. A. Scarbrough, A. A. Paton, John Overton, jr., B. J. Semmes.
Do.....	Merchants' Exchange.....	A. J. Livermore, J. F. Frank, A. D. Langstaff.
Milwaukee, Wis.....	Milwaukee Chamber of Commerce.	John L. Hathaway, John B. Merrill, David Vance.
Mobile, Ala.....	Mobile Cotton Exchange.....	W. H. Gardner, Adolph Proskaner, D. E. Huger.
Do.....	Mobile Chamber of Commerce.	Hon. Peter Hamilton, W. H. Gardner, E. O. Zadek.
Nashville, Tenn.....	Merchants' Exchange.....	J. W. Hopkins, E. D. Hicks, H. W. Grantland.
New Haven, Conn.....	Chamber of Commerce.....	Henry G. Lewis, Johnson T. Platt.
New London, Conn.....		James Fitch, George T. Marshall, H. S. Bartlett, E. A. Delaney, R. M. Waterman, Leonard Smith.
New Orleans, La.....	Cotton Exchange.....	Jas. A. Renshaw, chairman; J. L. McLean, R. S. Day, J. P. Dobbins.
Do.....	Produce Exchange.....	J. T. Brodnax, H. J. Roman, C. H. Allen.
Do.....	Sugar Exchange.....	J. Barkley, B. M. King, W. B. Bloomfield, P. Lanoux, W. Henderson.
New York City.....	Cotton Exchange.....	Walter T. Miller, Jas. F. Maury, Wm. P. Campbell.
Norfolk, Va.....	Norfolk and Portsmouth Cotton Exchange.	John N. Vaughan, Adam Tredwell.
Omaha, Nebr.....	Board of Trade.....	Thomas Gibson, Andrew Rosewater, Peter Windheim, F. C. Festner.
Oswego, N. Y.....	Board of Trade.....	J. L. McWhorter, A. S. Failing, W. R. Hosmer.
Pensacola, Fla.....	Board of Trade and Exchange.	Hon. S. C. Cobb, Hon. I. M. Tarble, H. Baars.
Philadelphia, Pa.....	Philadelphia Maritime Exchange.	Charles Gibbons, jr.; Edmund D. Smith, George E. Bartol.
Pittsburg, Pa.....	Coal Exchange.....	Richard Barrows, M. E. Lynn, John W. Risher.
Portland, Me.....	Board of Trade.....	C. H. Farley, M. N. Rich, William Senter.
Portland, Oreg.....	Chamber of Commerce and Board of Trade.	Rev. Dr. Geo. H. Atkinson, E. H. Page, George H. Himes.
Rochester, N. Y.....	Merchants' Exchange.....	John Siddons, H. S. Hebard, George Schofield.
San Diego, Cal.....	Society of Natural History.	Dr. G. W. Barnes, E. J. Buell, C. J. Fox.
Sandusky, Ohio.....	Board of Trade and City Council.	J. O. Moss, C. N. Ryan, R. B. Hubbard.
San Francisco, Cal.....	Chamber of Commerce.....	William L. Merry, Jacob S. Tabor, W. W. Dodge.
Savannah, Ga.....	Savannah Cotton Exchange.	O. M. Holst, A. L. Hartridge, J. J. Wilder.
Shreveport, La.....	Cotton Exchange.....	Col. R. H. Lindsay, Henry Florsheim, F. J. Alcocke.
Saint Louis, Mo.....	Merchants' Exchange.....	D. H. Bartlett, James L. Huse, John H. Carroll, Frank L. Johnston, Henry Laurey, C. S. Rogers.
Do.....	Cotton Exchange.....	I. T. Watson, sr.; C. W. Simmons, H. L. Rountree, J. H. Cogswell, C. S. Freeborn, Thomas S. Meir, W. E. Love.
Saint Paul, Minn.....	Saint Paul Chamber of Commerce.	R. O. Sweeney, Rev. David Breed, M. N. Kellog.
Toledo, Ohio.....	Toledo Produce Exchange..	W. T. Walker, W. H. Bellman, John Cummings.
Vicksburg, Miss.....		Capt. E. C. Carroll, Thomas Mount, Dr. G. W. Howard, J. D. Tieney.
Wilmington, N. C.....	Chamber of Commerce.....	A. H. Van Bokkelen, Geo. Harris, William L. De Roestet.
Yankton, Dak.....		J. C. McVay, chairman, president First National Bank; A. W. Barber, H. G. Clark.

## APPENDIX 65.

## REPORT OF THE FACT AND INTERNATIONAL BULLETIN DIVISION.

OFFICE OF THE CHIEF SIGNAL OFFICER,  
Washington, D. C., July 1, 1885.

In this division are prepared the Monthly Weather Review, the Summary and Review of International Meteorology, and the International Bulletin.

In the Review are discussed the general weather conditions for each month and any abnormal features. The tabulated reports and charts of this publication are of the greatest importance to all interested in meteorology. With the Review for August was issued a new chart (No. IV), exhibiting the departures from the normal atmospheric pressure and temperature; this chart is now a permanent feature of the Review, and its issue has elicited favorable comment from meteorologists.

The Summary and Review of International Meteorology has been continued, and efforts are being made to bring up to date the series of international charts (No. III—storm tracks) accompanying this publication. The increased amount of data now received (principally marine observations) renders possible a more accurate tracing of the storm centers, and greatly increases the value of the charts.

The International Bulletin was issued during the year, but it has been decided to discontinue its publication after June 30, 1885; the issue of the daily international chart (No. I), however, will be continued, the map being on a much larger scale than heretofore. For the names of chiefs of meteorological services of the different countries who have rendered valuable services in the execution of this work, see Appendices, which also give a list of steamship lines co-operating, and complete information as to all sources from which data are received.

H. H. C. DUNWOODY,  
First Lieutenant Fourth Artillery and Assistant.

## APPENDIX 65 A.

*List of military posts from which monthly meteorological reports have been received at the office of the Chief Signal Officer during the year ending June 30, 1885.*

Military posts.	State or Territory.	Military posts.	State or Territory.
Abraham Lincoln .....	Dakota.	Mojave.....	Arizona.
Alcatraz Island.....	California.	Monroe.....	Virginia.
Angel Island.....	Do.	Meade.....	Dakota.
Assinaboine.....	Montana.	Mount Vernon Barracks	Alabama.
Barrancas.....	Florida.	Mason.....	California.
Benicia Barracks.....	California.	Niagara.....	New York.
Brady.....	Michigan.	Pembina.....	Dakota.
Bidwell.....	California.	Plattsburg Barracks.....	New York.
Buford.....	Dakota.	Preble.....	Maine.
Bridger.....	Wyoming.	Presidio of San Francisco	California.
Brown.....	Texas.	Randall.....	Dakota.
Columbus.....	New York.	Reno.....	Indian Territory.
Concho.....	Texas.	Robinson.....	Nebraska.
David's Island.....	New York.	Shaw.....	Montana.
Ellis.....	Montana.	Sisseton.....	Dakota.
Fred Steele.....	Wyoming.	Snelling.....	Minnesota.
Gaston.....	California.	Saint Francis Barracks..	Florida.
Hamilton.....	New York.	Sully.....	Dakota.
Jefferson Barracks.....	Missouri.	Spokane.....	Washington.
Keogh.....	Montana.	Totten.....	Dakota.
Klamath.....	Oregon.	Townsend.....	Washington.
Lyon.....	Colorado.	Union.....	New Mexico.
Lewis.....	Do.	West Point.....	New York.
Madison.....	New York.	Wingate.....	New Mexico.
McDermitt.....	Nevada.	Yates.....	Dakota.
McDowell.....	Arizona.		
McHenry.....	Maryland.		

## APPENDIX 65 B.

*The following is a list of post-offices of voluntary observers who have transmitted monthly reports to the office of the Chief Signal Officer during the year ending June 30, 1885.*

[Their names are published in the Monthly Weather Review issued from this office.]

Post-office.	State or Territory.	Post-office.	State or Territory.
Antrim.....	New Hampshire.	Carthage.....	Missouri.
Ashwood.....	Tennessee.	Comfort.....	Texas.
Amherst (3).....	Massachusetts.	Charleston.....	Illinois.
Anna.....	Illinois.	Colorado Springs.....	Colorado.
Accotink.....	Virginia.	Clyde.....	Ohio.
Albany.....	Oregon.		
Austin.....	Tennessee.	De Soto.....	Nebraska.
Albany.....	New York.	Dyberry.....	Pennsylvania.
Archer.....	Florida.	Des Moines.....	Iowa.
Austin.....	Texas.	Dudley.....	Massachusetts.
Andersonville.....	Georgia.	Dorset.....	Vermont.
Allison.....	Kansas.	Drifton.....	Pennsylvania.
Aiken.....	South Carolina.	Dillingsville.....	Do.
Auburn.....	New York.	Dale Enterprise.....	Virginia.
Atchison.....	Kansas.	Deerfield.....	Massachusetts.
Ainsworth.....	Washington.	Dover.....	New Jersey.
Athens.....	Georgia.		
Ann Arbor.....	Michigan.	Embarras.....	Wisconsin.
Albion.....	Idaho.	Eola.....	Oregon.
Altoona.....	Pennsylvania.	Emporia.....	Kansas.
Ashville.....	North Carolina.	Emmitsburg.....	Maryland.
Ashland.....	New Hampshire.	Edginton.....	Illinois.
		Elk Falls.....	Kansas.
Beloit.....	Wisconsin.	Easton (2).....	Pennsylvania.
Blooming Grove.....	Pennsylvania.	Ellensburg.....	Washington.
Bunker Hill.....	Illinois.	East Portland.....	Oregon.
Blue Hill.....	Massachusetts.	Elk Park.....	North Carolina.
Bethel.....	Connecticut.	Fremont.....	Nebraska.
Brevard.....	North Carolina.	Fort Scott.....	Kansas.
Blakeley.....	Washington.	Factoryville.....	New York.
Belvidere.....	New Jersey.	Franklin.....	Pennsylvania.
Burlington.....	Vermont.	Fort Wayne.....	Indiana.
Bandon.....	Oregon.	Forsyth.....	Georgia.
Blacksburg.....	Virginia.	Fall River.....	Massachusetts.
Blue Lake.....	California.	Frankfort.....	Kentucky.
Birmingham.....	Alabama.	Fallsington.....	Pennsylvania.
Boyne.....	Michigan.	Fallston.....	Maryland.
Bird's Nest.....	Virginia.	Fort Madison.....	Iowa.
Brulington.....	Do.	Fort Collins.....	Colorado.
Birmingham.....	Michigan.	Franklin.....	Wisconsin.
Brattleborough.....	Vermont.	Fall Brook.....	California.
Buchanan.....	Michigan.	Fayetteville.....	Arkansas.
Braddock.....	Colorado.	Flat Rock.....	North Carolina.
Bristol.....	New Hampshire.	Fairbury.....	Nebraska.
Belmont.....	Do.		
Benaja.....	North Carolina.	Germantown.....	Pennsylvania.
		Genoa.....	Nebraska.
Cumberland.....	Maryland.	Gardiner.....	Maine.
Charlotte.....	Vermont.	Guttenberg.....	Iowa.
Cambridge.....	Massachusetts.	Grampian Hills.....	Pennsylvania.
Cornish.....	Maine.	Grand Coteau.....	Louisiana.
Catawissa.....	Pennsylvania.	Garrettsville.....	Ohio.
College Hill.....	Ohio.	Greensborough.....	Alabama.
Clay Centre.....	Kansas.	Green Springs.....	Do.
Cresco.....	Iowa.	Guilford.....	Indiana.
Cooperstown.....	New York.	Gallinas Spring.....	New Mexico.
Carson City.....	Nevada.	Grand Junction.....	Colorado.
Curryville.....	Missouri.		
Cleveland.....	Ohio.	Heath.....	Massachusetts.
Cincinnati.....	Do.	Hillsdale.....	Michigan.
Cedar Rapids (2).....	Iowa.	Helvetia.....	West Virginia.
Collinsville.....	Illinois.	Humboldt (2).....	Iowa.
Chambersburg.....	Pennsylvania.	Haverford College.....	Pennsylvania.
Chapel Hill.....	North Carolina.	Highlands.....	North Carolina.
Caldwell.....	New Jersey.	Humphrey.....	New York.
Cleburne.....	Texas.	Hulmeville.....	Pennsylvania.
Contoocook.....	New Hampshire.	Hudson.....	Michigan.
Conception.....	Missouri.	Hydesville.....	California.
Crete.....	Nebraska.	Hastin.....	Minnesota.
Chester.....	Minnesota.	Hinckley.....	Ohio.
College City.....	California.	Hartford.....	Connecticut.
Currie.....	Minnesota.	Hendon.....	Kansas.
Clinton.....	Indiana.	Harvard.....	Nebraska.
Clarksville.....	Texas.	Harrisville.....	Michigan.

*The following is a list of post-offices of voluntary observers who have transmitted monthly reports to the office of the Chief Signal Officer, &c.—Continued.*

Post-office.	State or Territory.	Post-office.	State or Territory.
Huntsville.....	Texas.	New Ulm.....	Texas.
Honey Grove.....	Do.	North Volney.....	New York.
Indianola.....	Iowa.	New Bedford.....	Massachusetts.
Ithaca (2).....	New York.	Nepht.....	Utah.
Independence.....	Iowa.	Newport.....	Florida.
Independence.....	Kansas.	New Athens.....	Ohio.
Ionia.....	Michigan.	Nayatt Point.....	Rhode Island
Independence.....	Missouri.	North Colebrook.....	Connecticut
Jacksonborough.....	Ohio.	Norfolk.....	Do.
Johnsontown.....	Virginia.	Orono.....	Maine.
Jeffersonville.....	Indiana.	Oakland.....	California.
Jefferson.....	Ohio.	Oskaloosa.....	Iowa.
Kalamazoo.....	Michigan.	Ogretta.....	North Carolina.
Klamath Agency.....	Oregon.	Ottumwa.....	Iowa.
Kiantone.....	New York.	Oswego.....	Kansas.
Kellys.....	North Carolina.	Oroville.....	California.
Lansing (2).....	Michigan.	Peoria.....	Illinois.
Logan.....	Iowa.	Port Jervis.....	New York.
Lawrence.....	Kansas.	Penn Yan.....	Do.
Lunenburg.....	Vermont.	Phillipsburg.....	New Jersey.
Lenoir.....	North Carolina.	Pierce City.....	Missouri.
Laconia.....	Indiana.	Paterson.....	New Jersey.
Logansport.....	Do.	Pro Tem.....	Missouri.
Lafayette.....	Do.	Poway.....	California.
Leetsdale.....	Pennsylvania.	Princeton.....	Do.
Limona.....	Florida.	Portsmouth.....	Ohio.
Lancaster.....	Wisconsin.	Princeton.....	Massachusetts.
Leavenworth.....	Kansas.	Peru.....	Nebraska.
Liberty Hill.....	Louisiana.	Pueblo.....	Colorado.
Luling.....	Do.	Puerto de Luna.....	New Mexico.
Le Roy.....	New York.	Providence.....	Rhode Island.
Lexington.....	Michigan.	Prairie du Chien.....	Wisconsin.
Lincolnton.....	North Carolina.	Palo Alto.....	Mississippi.
Leicester.....	Massachusetts.	Princeton (2).....	New Jersey.
La Grange.....	Indiana.	Point Pleasant.....	Louisiana.
Lake Village.....	New Hampshire.	Pacolet.....	South Carolina.
Los Angeles.....	California.	Post Mills.....	Vermont.
McDonogh.....	Maryland.	Quakertown.....	Pennsylvania.
Marshall.....	Michigan.	Quitman.....	Georgia.
Minneapolis.....	Minnesota.	Rowe.....	Massachusetts.
Manitowoc.....	Wisconsin.	Rockford.....	Illinois.
Mayport.....	Florida.	Ripon.....	Wisconsin.
Marengo.....	Illinois.	Readington.....	New Jersey.
Mendon.....	Massachusetts.	Red Willow.....	Nebraska.
Mount Ida.....	Arkansas.	Richardton.....	Dakota.
Manhattan (2).....	Kansas.	Richmond.....	Kentucky.
Muscatine.....	Iowa.	Rising Sun.....	Indiana.
Moorestown.....	New Jersey.	Raleigh.....	North Carolina.
Mount Vernon.....	Iowa.	Round Grove.....	Iowa.
Morrison.....	Dakota.	Readville.....	Massachusetts.
Mattoon.....	Illinois.	Reed City.....	Michigan.
Marion.....	Virginia.	Somerset.....	Massachusetts.
Monticello.....	Iowa.	South Orange.....	New Jersey.
Mountainville.....	New York.	Sandusky.....	Ohio.
Mendon.....	Michigan.	Snowville.....	Virginia.
Marquette.....	Nebraska.	Southington.....	Connecticut.
Madison.....	Wisconsin.	Savannah.....	Ohio.
Milan.....	Tennessee.	Salina.....	Kansas.
Mottville.....	Michigan.	Swanwick.....	Illinois.
Manchester.....	Iowa.	Stratford.....	Vermont.
Manistique.....	Michigan.	Stateburg.....	South Carolina.
Milledgeville.....	Georgia.	Salinas City.....	California.
Maud.....	Kansas.	Somerville.....	New Jersey.
Maynard.....	Iowa.	State College.....	Pennsylvania.
Manatee.....	Florida.	Sacramento.....	California.
Mauzy.....	Indiana.	Stockham.....	Nebraska.
Madison.....	Nebraska.	Swartz Creek.....	Michigan.
Moorestown.....	Michigan.	Sussex.....	Wisconsin.
Mahanoy Plane.....	Pennsylvania.	Spiceland.....	Indiana.
Medora.....	Dakota.	Sunman.....	Do.
Northfield.....	Minnesota.	Springfield.....	Arkansas.
Neillsville.....	Wisconsin.	Sycamore.....	Illinois.
Newport.....	Vermont.	Sandwich.....	Do.
Northport.....	Michigan.	Statesville.....	North Carolina.
North Lewisburg.....	Ohio.	Syracuse.....	New York.
		Salem.....	New Jersey.

*The following is a list of post-offices of voluntary observers who have transmitted monthly reports to the office of the Chief Signal Officer, &c.—Continued.*

Post-office.	State or Territory.	Post-office.	State or Territory.
Sherlock.....	Kansas.	Williamstown.....	Massachusetts.
Springfield.....	Missouri.	Wabash.....	Indiana.
San Rafael.....	California.	Westborough.....	Massachusetts.
Sterling.....	Kansas.	Wytheville (2).....	Virginia.
Summit.....	Virginia.	Washington (5).....	District of Columbia.
South Bethlehem.....	Pennsylvania.	White Plains.....	New York.
Stowe.....	Vermont.	Wellsburg.....	West Virginia.
South Evanston.....	Illinois.	Westerville.....	Ohio.
Seward.....	Nebraska.	Wellington.....	Kansas.
Traverse City.....	Michigan.	Woodstock.....	Vermont.
Thornville.....	Do.	Wellsborough.....	Pennsylvania.
Topeka.....	Kansas.	Worcester.....	Massachusetts.
Tallahassee.....	Florida.	Wauson.....	Ohio.
Taunton.....	Massachusetts.	Weir's Bridge.....	New Hampshire.
Terre Haute.....	Indiana.	Woodstock.....	Do.
Troy.....	Pennsylvania.	Wolfborough.....	Do.
Tamaqua.....	Do.	Wilkesbarre.....	Pennsylvania.
Tucson.....	Arizona.	Webster.....	Dakota.
Tecumseh.....	Nebraska.	West Bend.....	Iowa.
Tacoma.....	Washington.	Wausau.....	Wisconsin.
Tiffin.....	Ohio.	Wyandotte.....	Kansas.
Tower House.....	California.	Westmoreland.....	Do.
Variety Mills.....	Virginia.	Warrenton.....	Missouri.
Vevay.....	Indiana.	Wilton Centre.....	Illinois.
Vermillion.....	New York.	West Union.....	Iowa.
Voluntown.....	Connecticut.	Waterville.....	Maine.
Vermillion.....	Dakota.	Washington.....	Pennsylvania.
Vineland.....	New Jersey.	Wysox.....	Do.
Woodstock.....	Maryland.	Wentworth.....	Dakota.
West Chester.....	Pennsylvania.	Yates Centre.....	Kansas.
Weldon.....	North Carolina.	Yutan.....	Nebraska.
		Yellow Springs.....	Ohio.

## FOREIGN COUNTRIES.

Post-office.	Country.	Post-office.	Country.
Coal Harbor.....	British Columbia.	Mazatlan.....	Mexico.
Grand Turk.....	British West Indies.	Paramaribo.....	Dutch Guiana.
Mount Forest.....	Canada.	York Factory.....	Canada.

## APPENDIX 65 c.

*List of State weather services from which meteorological reports have been received at the office of the Chief Signal Officer during the year ending June 30, 1885.*

Alabama State weather service, under direction of Prof. P. H. Mell, jr., Auburn, Ala.  
Georgia State weather service, under direction of J. T. Henderson, commissioner of agriculture, Atlanta, Ga.

Illinois State weather service, under direction of C. F. Mills, secretary of the State board of agriculture, Springfield, Ill.

Indiana State weather service, under direction of Prof. H. A. Huston, Lafayette, Ind.

Indiana volunteer weather service, under direction of Prof. W. H. Ragan, Greencastle, Ind.

Iowa State weather service, under direction of Prof. Gustavus Hinrichs, Iowa City, Iowa.

Louisiana State weather service, under direction of Mr. Robert S. Day, New Orleans, La.

Michigan State weather service, under direction of Dr. H. B. Baker, Lansing, Mich.

Minnesota State weather service, under direction of Prof. W. W. Payne, Northfield, Minn.

Mississippi State weather service, under direction of Prof. R. B. Fulton, Oxford, Miss.

Missouri State weather service, under direction of Prof. F. E. Nipher, Saint Louis, Mo.

Nebraska State weather service, under direction of Prof. G. D. Swezey, Crête, Nebr.

New England Meteorological Society, under direction of Prof. W. Upton, Providence, R. I.

New Jersey State weather service, under direction of Mr. W. E. Cass, Newark, N. J.

Ohio State weather service, under direction of Prof. T. C. Mendenhall, Columbus, Ohio.

Tennessee State weather service, under direction of A. J. McWhirter, commissioner of agriculture, Nashville, Tenn.

## APPENDIX 65 D.

*List of foreign meteorological bureaus, vessels, and stations from which international simultaneous observations have been received.*

Algeria and Tunis, by M. Thivenet, director of the Meteorological College of Science of Algeria.

Australia, by R. L. J. Ellery, director of the observatory at Melbourne, New South Wales.

Austria-Hungary, by Prof. Dr. Julius Hann, director of the Imperial and Royal Central Meteorological Institute at Vienna.

Belgium, by J. C. Houzeau, director of the Royal Observatory at Brussels.

Brazil, by Prof. E. Cruls, director of the Imperial Observatory at Rio de Janeiro.

Great Britain, by the Meteorological Council, London, Robert H. Scott, F. R. S., secretary.

Canada, by Charles Carpmael, A. M., F. R. A. S., director of the Magnetic Observatory at Toronto, and superintendent of the Meteorological Office of the Dominion of Canada.

Cape Colony, by the Meteorological Commission of Cape Colony at Cape Town.

Chili, by authority of the secretary of public instruction, through Francisco Vidal Gormaz, president of the Central Meteorological Office at Santiago.

China, by W. Dorberck, Government astronomer, director of the observatory at Hong Kong, and by Marc. Dechevrens, S. J., director of the Meteorological Observatory at Zi-Ka-Wei.

Denmark, by Adam Paulsen, director of the Royal Danish Meteorological Institute at Copenhagen.

Egypt, by Albert Ismalun, director of the Laboratoire Khédivial du Caire.

France, by Prof. E. Mascart, director of the Central Meteorological Bureau of France.

Germany, by Prof. Dr. G. Neumayer, director of the German Marine Observatory at Hamburg.

Greece, by D. K. Kokkides, director of the Royal Observatory at Athens.

India, by H. F. Blanford, meteorological reporter to the Government of India.

Italy, by his excellency the minister of agriculture, industry, and commerce, through Prof. P. Tacchini, director of the Central Meteorological Office at Rome.

Japan, by the geographical bureau, department of the interior, through I. Arai, director of the Imperial Meteorological Observatory at Tokyo.

Mauritius, by C. Meldrum, secretary of the Meteorological Society of Mauritius.

Mexico, by authority of the secretary of public works, through Senor Mariano Bárcena, director of the Central Meteorological Observatory at Mexico.

Netherlands, by Prof. Buys Ballot, director of the Royal Meteorological Institute at Utrecht.

Norway, by Prof. H. Mohn, director of the Royal Norwegian Meteorological Institute at Christiania.

Portugal, by J. C. de Brito Capello, director of the Meteorological Observatory of the Infante Dom Luiz at Lisbon.

Russia, by Prof. H. Wild, director of the Imperial Central Physical Observatory of Russia at St. Petersburg.

Spain, by the directory of the Royal Observatory at Madrid.

Sweden, by Prof. R. Rubenson, director of the Royal Swedish Meteorological Institute at Stockholm, and by Prof. H. H. Hildebrandsson, director of the Meteorological Observatory at Upsala.

Switzerland, by Prof. E. Gautier, director of the observatory at Geneva.

Turkey, by A. Coumbary, effendi, director of the Central Observatory at Constantinople, and by Robert H. West, B. A., director of the Lee Observatory at Beirut.

United States of Colombia, by Ensign R. K. Wright, United States Navy, in behalf

of the General Interoceanic Canal Company, and the respective observers of all sub-series.

British Naval, by the Meteorological Council of London, through Robert H. Scott, F. R. S., secretary.

Portuguese Naval, by J. C. de Brito Capello, director of the Meteorological Observatory of the Infante Dom Luiz at Lisbon.

United States Navy, by the honorable the Secretary of the Navy, through Commodore John G. Walker, U. S. N., Chief of the Bureau of Navigation.

Series.	Stations reporting.	Series.	Stations reporting.
Algerian .....	9	Mexican .....	2
Australian .....	3	Netherlands .....	6
Austro-Hungarian .....	12	Norwegian .....	4
Belgian .....	4	Portuguese .....	9
Brazilian .....	1	Russian .....	40
British .....	27	Spanish .....	10
Canada .....	39	Swedish .....	6
Cape Colony .....	3	Swiss .....	1
Chilian .....	7	Turkish .....	4
Chinese .....	2	United States of Colombia .....	2
Danish .....	9	United States sub-series .....	6
Egyptian .....	1		
French .....	43	Total number of foreign stations re-	
German .....	16	porting daily .....	333
Greek .....	1	United States series .....	125
Indian .....	23		
Italian .....	17	Total number of stations reporting	
Japanese .....	23	daily to June 30, 1885 (land) .....	468
Mauritius .....	1		

## SUMMARY.

Number of vessels reporting in the—	
British navy .....	43
Portuguese navy .....	1
United States Navy .....	39
Marine reports furnished by the New York Herald weather service; vessels .....	66
Steamships, sailing vessels, &c., reporting direct to this office .....	419
Total naval and marine reports to June 30, 1885 .....	565
Total land stations reports to June 30, 1885 .....	468
Total number of international reports to June 30, 1885 .....	1033



## APPENDIX 66.

## REPORT OF ASSISTANT IN CHARGE OF STUDY DIVISION.

STUDY DIVISION, August 24, 1885.

SIR: I have the honor to submit the accompanying as my annual report of work done in the Study Division. The appendices A to H will be shortly submitted in duplicate. Very respectfully submitted.

CLEVELAND ABBE,  
*Professor and Assistant.*

The CHIEF SIGNAL OFFICER.

## APPENDIX 66 A.

*Annual report of Study Division, June 30, 1885.*

## PERSONAL.

During the past fiscal year the changes in this division have been as follows:

Professor Marvin was assigned to duty September 1, 1884, and was transferred to the Physical Laboratory in January, 1885; Sergeant Marbury was transferred to Marine Agency December 11, 1884; Corporal Daniels was transferred to Marine Agency December 3, 1884; Private Dilley was assigned to duty, December 3, 1884.

## CONSULTING SPECIALISTS.

As occasion has required, special questions have been referred to eminent scientists who have kindly acted gratuitously as consulting specialists.

## TABLES.

The tables referred to this division for preparation and revision have been the following:  
(1) Tables and instructions for the application of the gravity correction, prepared for use on and after January 1.

(2) The revision of tables for the computation of dew-point and humidity: these are now being prepared conjointly with Professors Ferrel and Marvin. An independent investigation of one portion of this subject has been prosecuted by Professor Hazen in connection with the exposure of thermometers.

(3) The annual revision of the table of monthly constants for reduction of the barometer to sea level at Signal Service stations has been made and promulgated as General Orders No. 6, 1885. A corrected copy of this table, together with all changes made up to June 30, is submitted herewith. Improved methods for this reduction have also been prepared and recommended by me for adoption in place of the monthly constants now in use, as the latter often give very objectionable distortions of the isobars. Numerous smaller tables have been prepared for use in the Fact and International Bulletin Division.

## INSTRUMENTAL STANDARDS.

The general question of the construction and preservation of the instrumental standards of this office was by Instructions No. 6, 1885, transferred to the Physical Laboratory Division. I have, therefore, referred to that division with appropriate recommendations, such unfinished work and new questions as refer to this subject.

## STANDARD EXPOSURES AND ERRORS DUE TO EXPOSURE AND ESTABLISHMENT OF INSTRUMENTS.

(a) *Barometer*.—No changes in the method of mounting the barometer has taken place since the introduction of the barometer box. In order to ascertain the possible influence of wind, and especially the correction for the effect of suction up a chimney upon the pressure within a room in direct connection therewith, I have devised the form of mounting mentioned in my previous reports, and recommend that a trial of it be made.

The errors incurred in changing the locations of barometers at stations have been investigated, and a report submitted from which it is seen that sometimes comparisons are not at present made with sufficient accuracy to determine instrumental changes less than 0.01 or even 0.02 inch.

(b) *Thermometers*.—The question of the proper exposure of thermometers has continued a matter of careful study in this division. Extensive experiments have been carried on both in this city and at Fort Myer and in other places. A report on the work accomplished, embodying the results of all the experiments, has been prepared by Professor Hazen and published as Professional Paper No. XVIII (now in press). As a practical application of the results of these investigations an improved shelter has been adopted, by the recommendation of a special board of officers, especially on that of Professor Hazen, and has already been supplied to many Signal Service stations. Continuous attention is also devoted to the locations and environments of thermometers and shelters and many improvements have been made.

The special board just alluded to has decided to adopt some form of whirling thermometer simultaneously with the adoption of Ferrel's improved psychrometric tables.

(c) *Anemometers*.—These have always been established at Signal Service stations as high as practicable above the roof or ground. Observations have shown that the velocity of the wind increases quite rapidly up to an altitude of about 100 feet, and after that more slowly. No uniform altitude for location of anemometers has been adopted nor is practicable, but a method of reducing all records to a standard altitude is desirable.

The comparison of anemometers on station with the standard at Washington by means of substandards that are carried by inspecting officers has never yet been attempted by this service, but evidently should not longer be neglected. A first series of this kind has been made and demonstrates the practicability and importance of such work.

From measurements made as to dimensions of station anemometers, I find that our recorded velocities are in excess by about 20 per cent. of their true value as computed by Dohrandt's formula; in other words our records should be multiplied by the factor .85 to obtain the correct velocities. The application of this correction will, it seems to me, be an important improvement in our work and a proposition to the next International Congress looking to the general adoption of a similar instrumental correction is recommended by me. The exact determination of the above factor for each anemometer by the use of the whirling table should be made the duty of the Physical Laboratory as soon as it is practicable to establish the apparatus.

As requests are frequently made for data as to the force of the gusts in our heaviest hurricanes and tornadoes, to the observation of which the Robinson anemometer is not adapted, I have for several years desired to construct and experiment with several special forms of anemometers, hoping thereby to obtain the data desired by builders and engineers. Apparatus for this purpose has been designed and its construction is recommended by me.

(d) *Rain-gauge*.—The effect of variations in the exposure of rain-gauges has been studied by special observations at Mount Washington and by duplicate records made at about sixty other stations. On account of the large variation due to roof exposure in the collection of rain and snow, it may become necessary to establish standard rain-gauges in open fields outside the cities occupied by Signal Service stations. Our rainfall as at present recorded varies from what appears to be the true amount by percentages, ranging from 40 per cent. deficiency to a slight excess. The remedies for this are (1) improved exposures, or (2) the correction of present records. As to the first, efforts are being made wherever possible to improve the exposure; as to the second, a correction to annual averages may perhaps be obtained, but not one for monthly or individual record.

## DROSOMETER.

In answer to several requests for apparatus for measuring dew, I have sketched out a simple form which has met with the approval of Professor Mendenhall, and with which he has promised to make comparative observations with a standard before issuing to stations.

## EVAPORIMETER.

The question of evaporation from water and snow, and especially from vegetation, has continued to be entirely omitted from the schedule of Signal Service observations. This neglect of a matter in many respects so important is partly explicable by the difficult and unsatisfactory nature of the methods of observing, and partly by our indulging the hope that on account of its bearing on agriculture the matter would be more fully taken up by the agricultural colleges and State weather services. To a certain extent the difference between the wet bulb and dew point on the one hand and the wet bulb and dry bulb on the other gives us the means of determining the general character of the prevailing evaporation. Many important meteorological problems can however be answered only by knowing definitely the amount of evaporation from each portion of the earth's surface. I therefore consider it urgently desirable to inaugurate observations on this subject at a number of selected stations.

## SKY COLORS.

The accurate observation of the colors of the sky promises to give important information with regard to the vapor and dust suspended therein. These observations should cover not only the blue tints recorded by the use of Arago's cyanometer, but also the red, purple, and green that are frequently observed. Probably some modification of Maxwell's color box will be found the most convenient apparatus, and several capable men should be set to work on this problem. It will be remembered that the red skies of 1883 found us wholly unprepared for this kind of observation, a misfortune that should not be allowed to happen again.

## SPECTROSCOPE AND POLARISCOPE.

Each of these instruments offers in its own way information relative to the moisture in the atmosphere not obtainable from other sources. Through the kind co-operation proffered by Professor Cook, of Dartmouth College, and Professor Pickering, of Harvard University, it is hoped that valuable results may be obtained from observations with the modified forms of these instruments that have been devised.

## TIME.

I attended as a delegate the International Prime Meridian and Time Conference, held in this city in October, 1884. The standard clock is in the hands of the makers for necessary alterations. The fire-proof room for the preservation of a constant temperature around the clock has been transferred to the Stations Division for the storage and preservation of records. On January 1, 1885, the clocks at all Signal Service stations were set to the time of the seventy-fifth meridian. To facilitate this change, a table showing for all stations the difference between true local time and seventy-fifth meridian time was prepared.

## ATMOSPHERIC ELECTRICITY.

At a national congress of electricians held in September, 1884, in Philadelphia, I presented by your instructions a statement of Signal Service work in atmospheric electricity and received assurance of hearty co-operation. An advisory committee was appointed to report upon an international system of observations and records. The observations of ground currents at Ooglaamie, Alaska, have been reduced by Professor Trowbridge and Sergeant McRae for publication in Lieutenant Ray's report of his work at that station. Since December, 1884, the subject of atmospheric electricity has been transferred to the hands of Professor Mendenhall, in charge of the physical laboratory.

## SOLAR RADIATION.

A standard pair of conjugate thermometers was ordered during the previous fiscal year, and although not yet received, it was decided to issue early in the present year the apparatus already on hand to twenty selected stations without waiting for the desired comparative readings, and with such instructions as might be agreed upon and recommended by Professor Ferrel and myself. The effect of the great variety of exposures that must inevitably occur at Signal Service stations was by me considered to be likely sensibly to invalidate the results, and I felt it necessary to ascertain experimentally

what method would be practicable for overcoming this difficulty. Unfortunately, the record of observations bearing on this matter was lost in the confusion incident to the fire in February, 1885. As soon as this work can be repeated and a uniform method of exposure can be decided on, or, still better, a method of correction for the peculiarities of any exposure, it will be practicable to issue the conjugate thermometers to selected stations. Meanwhile the importance of other forms of apparatus, especially the methods of chemical reactions, has been strongly urged by agriculturists because of their more direct application to the growth of plants.

The duration and intensity of sunshine constitutes an independent phenomenon having some points in common with the preceding and a simple form of sunshine recorder less expensive and more certain than the Campbell recorder is very desirable.

#### MOUNT WHITNEY RESERVATION.

Proposals have been received from responsible parties in California offering to secure the equipment of a full station on the Mount Whitney Reservation. It is very desirable that this should be accomplished soon.

#### THUNDERSTORM SUB-DIVISION.

The special observation and study of thunderstorms begun last year by Professor Hazen, with the kind co-operation of the Post-Office Department, has been carried on in the thunderstorm subdivision with valuable results. About 15,000 reports on postal cards from 2,500 observers have been received. Monthly summaries of thunderstorms are compiled for insertion in the Monthly Weather Review, and a report on the thunderstorms of May, 1884, has been published as Signal Service Note No. 20. A partial study of the storms of the year 1884 was completed in April, and, with your permission, was presented before the Philosophical Society of Washington as a summary of the results thus far obtained from this work. This paper is in course of preparation for publication.

#### TORNADO SUBDIVISION.

The methods of investigation in use during the preceding year have been employed this year with but few changes or additions.

A large part of the work of this subdivision consists in the collection of data relative to tornadoes and other violent local storms.

During the past year 461 additional tornado reporters have been secured, thus making the total number of tornado stations 1,307. These reporters are supplied with the necessary blanks, circulars, and envelopes to enable them to render reports to this office without expense to themselves for these materials.

In the prosecution of the work 4,744 communications have been sent out during the year and 2,770 letters received, together with 1,023 regular reports filled out on forms furnished for the report of tornadoes and destructive storms. Additional data has also been obtained from newspaper clippings either furnished by tornado reporters or obtained from the regular file of papers at this office; several hundred such clippings have been filed in tornado scrap-books during the year.

Some attention has been given to the collection of views and photographs pertaining to tornadoes; 519 have been obtained and placed in tornado albums. Seven hundred and twelve tornado reporters have been supplied with State maps for the purpose of charting thereon tornado tracks to be used in the more complete description of such storms.

For purposes of special study there have been prepared 105 charts showing the temperature and direction of the wind at numerous stations on the days on which tornadoes occurred, and as near the time of occurrence of the tornado as it was possible to obtain the observations. These charts are for the years 1882, 1883, and 1884.

Preliminary tornado charts, showing the relation of tornado centers to areas of barometric minima (4 charts in each set) were prepared for the tornadoes which occurred on July 4 and 5, August 2 and 28, September 9 and 28, 1884; January 11, March 11, 12, 27, and 28, April 1, 19, 21, 22, and 29, 1885; the total number of charts prepared being 64.

Daily tornado predictions were made by Lieutenant Finley in 1884 from March 10 to August 1, and were resumed in 1885 on June 1. The verification of these special predictions and the calculation of the proper percentage of verification has been carefully considered.

Professional Paper No. XVI, "Tornado studies for 1884," has been prepared by this subdivision; this contains among other things a chronological list of the 180 tornadoes which occurred during the year, with numerous charts showing the geographical distribution of tornadoes and their relation to barometric minima. Tornado circular No. 21 has also

been prepared and issued to reporters; this contains instructions regarding the making of comparative observations. Ten monthly abstracts of tornado reports have been prepared for the officer in charge of the Fact and International Bulletin Division to be used in the preparation of the Monthly Weather Review.

During the year all back reports have been examined, the data abstracted and entered in the tornado record books, and in local storm record books. In addition to these a number of papers, journals and other records on file in the Congressional Library have been examined and storm notes collected therefrom. The manuscript meteorological records at the Smithsonian Institution have been arranged by Professor Baird preparatory to an examination of them. A card index of all the tornadoes entered in the tornado record books has been compiled. A list of names and addresses of all tornado reporters is furnished herewith.

#### BIBLIOGRAPHY OF METEOROLOGY.

The compilation and editing of a complete index to the literature of meteorology was assigned to Mr. C. J. Sawyer on March 3, 1884, under my general supervision.

The material then on hand consisted of about 20,000 titles contributed by Prof. G. J. Symons, of London, and about the same number copied by myself from the Catalogue of scientific papers, published by the Royal Society.

The general plan of further work on this subject was approved by you as follows: "All additions consistent with an early publication to be secured; scope to be closely restricted to that of the Symons catalogue; bibliography to end with the year 1881; form to be that of a classed subject catalogue with full author index." This outlined plan has been strictly followed, except in so far as the want of an appropriation for printing has postponed the publication of the work, and will consequently permit a more extended collection of material.

On June 30, 1884, the number of accepted titles was about 26,853, after rejecting a large number of duplicates, and all of those relating to meteors, earthquakes, molecular physics, and other extraneous subjects, but retaining terrestrial magnetism. The work of the present year has been directed mainly to the correction and completion of defective titles and the collection of new ones.

For the latter purpose special attention has been paid to the serial literature previous to 1800, and subsequent to 1863. To do this it has been necessary personally to examine the libraries at Washington, Baltimore, and Philadelphia; the libraries of other cities will probably need to be examined in like manner. A summarized list of additions to the bibliography is given in Appendix C, which shows 20,338 new titles added during the year.

Besides the above new titles, there are on hand about 7,414 cards not yet examined for duplicates, the net addition from which will probably not be large.

The correspondence of the year has resulted in many very valuable contributions from scientists and librarians in this country and abroad.

To insure accuracy in the case of living writers, efforts have been made to obtain from authors personal lists of their publications; lithograph letters requesting such lists have been sent to 325 meteorological writers; including all countries except the German Empire, where Dr. Hellmann's employment of the same method rendered this unnecessary. Replies to 147 of these letters have been received, contributing manuscript lists of 7,495 titles.

In addition to those who have co-operated with us by furnishing lists of their own publications, many meteorologists and librarians have contributed special bibliographies for their respective countries, extracts from manuscript library catalogues, and other valuable bibliographical lists. A list of the more important of these contributions is given herewith.

When finished, the bibliography will fill two volumes of 900 octavo pages each. In order to have Volume I ready for the printer early in the fiscal year 1886-'87, the distinctive work of collection must soon cease and the entire force be employed on editorial work, consisting of classification by subjects, preparation of author index and periodical list, determination of details of publication, final revision of titles, and technical preparation for the printer.

The most difficult part of the work is the formation of a subject classification and the classification of titles under this, a work rendered especially difficult by the fact that many of the works and papers are not available for reference, often necessitating the determination of subjects from brief and ambiguous titles.

Dr. A. Lancaster, librarian of the Royal Observatory of Brussels, and joint author with Dr. Houzeau of "Catalogue des ouvrages d'astronomie et de météorologie. Bruxelles, 1878," and the admirable "Bibliographie générale de l'astronomie. Tome II. Bruxelles, 1882," has kindly granted his assistance in the formation of a subject classification, and has submitted a draft of one, which, with modifications, will answer excellently for the purpose.

The preparation of an author index will be carried on in connection with classification, and in such a way that, in case no appropriation for publishing be secured at the next session of Congress, the bibliography and index will be in the best possible form for use as a card catalogue.

#### LOCATIONS OF STATIONS.

The determination of the latitude and longitude and elevation of stations has continued in the hands of Professor Hazen, and revised values of these quantities have been furnished the Stations Division from time to time. The accompanying table (Appendix D) gives the elevation of all the barometers of the service on January 1, 1884, and all changes from that date up to June 30, 1885.

An attempt has been made to utilize the results of the precise line of levels now being prosecuted by the Coast and Geodetic Survey, and the elevations thus determined are properly designated in the accompanying table.

It is evident that the uncertainty of altitudes based on railroad levels may lead to appreciable errors in our barometric work, and it is very desirable that the accurate work of the Coast Survey should be extended to all our interior stations, if possible. To this end the correspondence had with the Coast Survey in 1881 has been revived, and it is hoped that it will be practicable to carry out the plan of work then mutually agreed upon.

#### BALLOON VOYAGES.

By an arrangement with Prof. S. A. King, aeronaut, of Philadelphia, four balloon voyages have been made, with the special object of studying the distribution of temperature and moisture. The results are of the highest accuracy, and show the desirability of similar regular work in this field. The service is indebted to Professor King, who has done this work without other remuneration than the repayment of actual expenses. A full report of the results attained by the observer, Private Hammon, will be submitted for publication.

#### BOLOMETER STUDIES.

During the past two years our collaborer, Prof. S. P. Langley, has experimented upon a large scale with the bolometer as a means of detecting the amount of moisture in the free open air. He states that his observations with this instrument give important data bearing upon the distribution of heat in both the earth and the atmosphere. It is to be hoped that by repeating his observations in some other climate and locality, such as that of Washington, a complete check upon his results may be obtained, and to this end I recommend that he be invited to bring his apparatus to this city, where the grounds at Fort Myer afford an excellent location.

#### EARTHQUAKE OBSERVATIONS.

In October, 1884, I attended a conference called by the Director of the Geological Survey to discuss methods and plans for observations of earthquakes.

On the part of this office I assured the conference that you would maintain observations and seismographic records at Signal Service stations whenever the committee should agree upon satisfactory apparatus.

#### INSTRUCTION IN METEOROLOGY.

The course of instruction for lieutenants at this office, having special regard to work in the Indications Division, began June 1, 1885, since which time daily lectures of two hours each have been given by Professor Mendenhall and myself.

Lectures on meteorological subjects have been delivered by myself in the Washington Young Men's Christian Association lecture course and by Professor Hazen and Sergeant Curtis at the Washington high school.

The preparation of an elementary text-book on meteorology, designed to be introductory to the higher treatise on meteorology by Professor Ferrel, has been undertaken by Mr. W. M. Davis, of Cambridge, Mass.; it will probably meet the wants of this service, and be proper to put into the hands of every officer and enlisted man. A professional paper on the theory of instruments used in meteorology has been in course of preparation by me the past year. Its contents will be orally given to the class now under instruction, whose course began on June 1.

## PUBLICATIONS.

Besides a number of minor articles, the following published papers have been prepared by members of the Study Division:

- Abbe, Cleveland—Progress in Meteorology in 1884. 176 pp. 8vo, 1885.  
 Testimony before the Joint Committee of Congress.  
 "The earthquake of August 10." New York Herald, August 12, 1884.  
 Appalachian earthquakes. New York Herald, August 15, 1884.
- Fassig, O. L.—Bibliography of Meteorology for 1884.
- Finley, Jno. (Lieut.)—Signal Service Professional Paper, No. 14.  
 Signal Service Professional Paper, No. 16.  
 Signal Service Tornado Circular, No. 21.
- Hazen, H. A.—"Tornado Generation." Amer. Meteor. Journal, September, 1884.  
 Tornadoes. Amer. Journal of Science, vol. xxviii, September, 1884.  
 Thunder-storms and their relation to "Low." Proc. A. A. S., vol. xxxiii.  
 Philadelphia meeting, September, 1884.  
 Determination of air temperature and humidity. Amer. Meteor. Journal, vol. i, Nos. 9 and 10, January, February, 1885; translation in the Zeitschrift für Meteorologie, vol. xx, March, 1885.  
 Thunder-storms of May, 1884. Signal Service Notes, No. 20.
- Curtis, G. E.—Reviews of Quarterly Journal of Meteorology and Symons' Meteorological Magazine in American Journal of Meteorology.

## TRANSLATIONS.

The following articles have been translated in order to make them available for general use in the office:

- "Ueber die Bestimmung der Temperatur und Feuchtigkeit der Luft." H. Wild. Zeitschrift für Meteorologie, October, 1884.
- "Sui grandi movimenti della atmosfera e sulla previsioni del tempo. Prof. D. Ragona, Modena, 1881." Gratuitously translated by Rev. J. Hagen.
- "Evaporation": de Saussure, in his Voyage dans les Alpes. Tome vii; chap. viii.  
 [Climates of the globe]—Woeikof; first three chapters.  
 [The Glacial Epoch]—Woeikof.  
 [Glaciers and climate]—Woeikof.
- "Le Siroco en Amérique et en Asie." F. F. Hébert. Annuaire de la Société mét. de France, pp. 85-89, vol. xxix, 1881.

## APPENDIX 66 B.

SIGNAL OFFICE, WAR DEPARTMENT,  
 Washington, January 31, 1885.

GENERAL ORDERS }  
 No. 6.

The following table of monthly constants for the reduction of barometric observations to sea-level and standard gravity is published for the information of all concerned, and will go into daily use on March 1, 1885, replacing General Orders No. 5, from this office, series of 1884. On and after the above-mentioned date the columns of Form 113a headed "reduced to sea-level" will be amended to read "reduced to sea-level and standard gravity." The monthly mean pressures reduced to sea-level and standard gravity by this table for the months of January and February, 1885, will be inserted in red ink at the bottom of page 2 of Form 113a.

By order of the Chief Signal Officer.

B. M. PURSELL,  
 Second Lieutenant, Signal Corps, U. S. Army.

*Monthly constants (in inches) for the combined reduction of barometric observations made at Signal Service stations to sea-level and standard gravity.†*

Station.	Gravity correction.	Combined reduction constant (gravity and elevation) for each month.											
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Albany, N. Y.	-0.006	0.09	0.09	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.09	0.09
Alexander, Fort, Alaska	+0.086	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Alpena, Mich.	-0.000	0.71	0.71	0.70	0.69	0.68	0.65	0.64	0.64	0.65	0.67	0.69	0.71
Apache, Fort, Ariz.	-0.025	5.09	5.07	5.03	4.90	4.80	4.73	4.72	4.70	4.77	4.83	5.08	5.06
Assinaboine, Fort, Mont.	+0.009	3.06	3.06	3.03	2.92	2.86	2.81	2.75	2.77	2.87	2.94	3.00	3.05
Atlanta, Ga.	-0.029	1.20	1.19	1.18	1.16	1.14	1.13	1.12	1.13	1.14	1.16	1.19	1.20
Atlantic City, N. J.	-0.015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Augusta, Ga.	-0.031	0.16	0.16	0.16	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.16	0.16
Baltimore, Md.	-0.015	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04
Barnegat City, N. J.	-0.014	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Behring's Island, Behring Sea	+0.027	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Bennett, Fort, Dak.	-0.001	1.74	1.73	1.70	1.64	1.56	1.54	1.54	1.54	1.59	1.62	1.69	1.76
Benton, Fort, Mont.	+0.006	2.98	3.00	2.98	2.86	2.79	2.77	2.71	2.79	2.84	2.91	2.96	3.00
Bismarck, Dak.	+0.005	2.00	1.98	1.92	1.88	1.79	1.76	1.73	1.76	1.80	1.88	1.93	2.02
Block Island, R. I.	-0.010	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Boise City, Idaho	-0.004	2.93	2.96	2.92	2.84	2.84	2.78	2.72	2.75	2.77	2.86	2.94	2.96
Boston, Mass.	-0.007	0.14	0.14	0.13	0.13	0.13	0.13	0.12	0.12	0.13	0.13	0.13	0.14
Brownsville, Tex.	-0.048	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Buffalo, N. Y.	-0.005	0.78	0.79	0.78	0.70	0.73	0.72	0.71	0.71	0.72	0.74	0.77	0.78
Buford, Fort, Dak.	+0.008	2.24	2.22	2.17	2.11	2.01	2.00	1.97	1.99	2.03	2.11	2.17	2.28
Cairo, Ill.	-0.021	0.38	0.38	0.37	0.36	0.35	0.35	0.33	0.35	0.35	0.36	0.37	0.38
Canby, Fort, Wash.	+0.004	0.21	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Cape Henry, Va.	-0.021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cape May, N. J.	-0.016	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cape Mendocino, Cal.	-0.012	0.68	0.68	0.68	0.68	0.67	0.67	0.67	0.67	0.67	0.68	0.68	0.68
Cedar Keys, Fla.	-0.041	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
Charleston, S. C.	-0.032	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Charlotte, N. C.	-0.025	0.86	0.86	0.85	0.83	0.81	0.80	0.80	0.80	0.81	0.83	0.85	0.86
Chattanooga, Tenn.	-0.026	0.83	0.83	0.82	0.81	0.79	0.78	0.77	0.78	0.79	0.80	0.82	0.84
Cheyenne, Wyo.	-0.009	6.26	6.26	6.19	6.01	5.88	5.75	5.70	5.71	5.87	6.03	6.22	6.29
Chicago, Ill.	-0.008	0.74	0.74	0.73	0.72	0.69	0.69	0.68	0.68	0.69	0.71	0.73	0.75
Chinoctague, Va.	-0.019	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Cincinnati, Ohio.	-0.016	0.67	0.67	0.66	0.64	0.62	0.62	0.61	0.61	0.61	0.62	0.63	0.66
Cleveland, Ohio.	-0.010	0.77	0.78	0.77	0.75	0.72	0.72	0.71	0.71	0.71	0.73	0.76	0.78
Columbus, Ohio.	-0.013	0.90	0.90	0.89	0.87	0.84	0.83	0.82	0.82	0.83	0.86	0.89	0.91
Concho, Fort, Tex.	-0.033	1.99	1.95	1.94	1.91	1.87	1.84	1.85	1.93	1.87	1.92	1.98	1.99
Custer, Fort, Mont.	+0.002	3.38	3.36	3.33	3.18	3.10	3.06	3.02	3.06	3.12	3.24	3.32	3.40
Davenport, Iowa.	-0.010	0.70	0.69	0.68	0.66	0.64	0.63	0.62	0.62	0.64	0.65	0.68	0.70
Davis, Fort, Tex.	-0.031	4.94	4.92	4.81	4.75	4.68	4.57	4.60	4.61	4.66	4.81	4.86	4.90
Dayton, Wash.	+0.004	1.81	1.82	1.82	1.76	1.76	1.75	1.72	1.72	1.73	1.79	1.79	1.84
Deadwood, Dak.	-0.002	4.95	4.92	4.84	4.69	4.52	4.44	4.43	4.44	4.56	4.68	4.84	4.99
Delaware Breakwater, Del.	-0.017	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
Denver, Colo.	-0.012	5.51	5.51	5.43	5.26	5.15	5.03	5.00	5.01	5.10	5.25	5.49	5.51
Des Moines, Iowa.	-0.009	0.96	0.96	0.94	0.91	0.88	0.87	0.86	0.86	0.88	0.90	0.92	0.94
Detroit, Mich.	-0.007	0.75	0.75	0.74	0.72	0.69	0.69	0.68	0.68	0.69	0.71	0.74	0.75
Dodge City, Kans.	-0.018	2.71	2.70	2.69	2.60	2.51	2.47	2.46	2.44	2.51	2.59	2.70	2.76
Dubuque, Iowa.	-0.006	0.75	0.74	0.73	0.71	0.69	0.67	0.66	0.67	0.69	0.70	0.72	0.75
Duluth, Minn.	+0.005	0.80	0.80	0.78	0.76	0.74	0.72	0.71	0.71	0.73	0.75	0.78	0.80
Eastport, Me.	0.000	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Elliott, Fort, Tex.	-0.024	2.91	2.88	2.81	2.76	2.68	2.65	2.62	2.62	2.67	2.77	2.91	2.94
El Paso, Tex.	-0.030	3.85	3.85	3.77	3.71	3.61	3.56	3.57	3.57	3.62	3.71	3.82	3.83
Erie, Pa.	-0.008	0.76	0.76	0.76	0.74	0.71	0.71	0.70	0.70	0.71	0.73	0.75	0.77
Escanaba, Mich.	+0.002	0.72	0.72	0.71	0.69	0.66	0.65	0.64	0.64	0.66	0.68	0.70	0.72
Fort Smith, Ark.	-0.026	0.50	0.50	0.49	0.47	0.46	0.46	0.45	0.45	0.46	0.47	0.49	0.50
Galveston, Tex.	-0.040	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grand Haven, Mich.	-0.005	0.70	0.70	0.70	0.68	0.66	0.65	0.64	0.64	0.65	0.67	0.69	0.70
Grant, Fort, Ariz.	-0.028	4.87	4.83	4.80	4.70	4.58	4.51	4.54	4.54	4.57	4.67	4.81	4.85
Greencastle, Ind.	-0.014	0.99	0.98	0.97	0.94	0.92	0.91	0.90	0.90	0.92	0.94	0.96	0.99
Hatteras, N. C.	-0.026	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Helena, Mont.	+0.003	4.38	4.35	4.32	4.21	4.12	4.07	4.01	4.04	4.12	4.25	4.33	4.33
Huron, Dak.	-0.002	1.54	1.52	1.48	1.45	1.35	1.34	1.32	1.34	1.38	1.43	1.48	1.54
Indianapolis, Ind.	-0.014	0.84	0.84	0.83	0.81	0.78	0.78	0.77	0.77	0.78	0.80	0.83	0.85
Indianaola, Tex.	-0.042	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Jacksonville, Fla.	-0.038	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Keokuk, Iowa.	-0.012	0.69	0.69	0.68	0.66	0.64	0.63	0.62	0.62	0.64	0.65	0.68	0.70
Key West, Fla.	-0.061	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Kitty Hawk, N. O.	-0.024	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Knoxville, Tenn.	-0.023	1.05	1.05	1.04	1.02	0.99	0.99	0.98	0.98	0.99	1.01	1.04	1.06
La Crosse, Wis.	-0.003	0.82	0.81	0.80	0.78	0.76	0.74	0.73	0.74	0.75	0.77	0.80	0.82
Leavenworth, Kans.	-0.015	0.94	0.94	0.92	0.89	0.86	0.85	0.84	0.85	0.86	0.89	0.92	0.95
Lewiston, Idaho.	+0.004	0.83	0.83	0.82	0.80	0.79	0.78	0.77	0.77	0.78	0.80	0.83	0.84
Little Rock, Ark.	-0.028	0.29	0.29	0.29	0.28	0.27	0.27	0.27	0.27	0.27	0.28	0.29	0.29
Los Angeles, Cal.	-0.029	0.36	0.36	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.36
Louisville, Ky.	-0.018	0.59	0.59	0.58	0.58	0.56	0.56	0.55	0.55	0.56	0.57	0.58	0.59
Lynchburg, Va.	-0.029	0.70	0.70	0.70	0.68	0.66	0.65	0.65	0.65	0.66	0.67	0.70	0.71



*Monthly constants (in inches) for the combined reduction of barometric observations made at Signal Service stations to sea-level and standard gravity—Continued.*

Station.	Gravity cor- rection.	Combined reduction constant (gravity and elevation) for each month.											
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Mackinaw City, Mich.	+0.002	0.71	0.70	0.70	0.68	0.66	0.65	0.64	0.64	0.65	0.67	0.69	0.70
Macon, Fort, N. C.	-0.028	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
Maginnis, Fort, Mont.	+0.005	4.77	4.75	4.60	4.50	4.41	4.33	4.31	4.31	4.40	4.54	4.60	4.63
Marquette, Mich.	+0.004	0.79	0.79	0.78	0.76	0.73	0.72	0.71	0.72	0.73	0.74	0.77	0.79
Memphis, Tenn.	-0.027	0.33	0.33	0.32	0.31	0.31	0.30	0.30	0.30	0.31	0.31	0.33	0.33
Milwaukee, Wis.	-0.005	0.80	0.79	0.78	0.77	0.74	0.73	0.72	0.72	0.73	0.75	0.78	0.80
Mobile, Ala.	-0.037	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Montgomery, Ala.	-0.033	0.21	0.21	0.20	0.20	0.20	0.19	0.19	0.19	0.19	0.20	0.20	0.21
Moorhead, Minn.	+0.005	1.11	1.10	1.08	1.04	0.98	0.97	0.96	0.97	1.00	1.02	1.07	1.12
Mount Washington, N. H.	-0.002	6.63	6.62	6.52	6.41	6.18	6.12	6.07	6.08	6.15	6.34	6.56	6.63
Myer, Fort, Va.	-0.016	0.29	0.29	0.28	0.28	0.27	0.26	0.26	0.26	0.26	0.27	0.28	0.29
Nashville, Tenn.	-0.023	0.58	0.58	0.58	0.56	0.55	0.54	0.54	0.54	0.55	0.56	0.58	0.59
New Haven, Conn.	-0.010	0.11	0.11	0.11	0.11	0.11	0.10	0.10	0.10	0.10	0.11	0.11	0.11
New London, Conn.	-0.010	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
New Orleans, La.	-0.039	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
New York City	-0.012	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16	0.16	0.17	0.17	0.17
Norfolk, Va.	-0.021	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
North Platte, Nebr.	-0.010	3.10	3.08	3.04	2.94	2.85	2.78	2.78	2.78	2.86	2.94	3.06	3.14
Olympia, Wash.	+0.005	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05
Omaha, Nebr.	-0.010	1.24	1.23	1.22	1.18	1.14	1.13	1.12	1.12	1.14	1.16	1.22	1.25
Oswego, N. Y.	-0.004	0.38	0.38	0.38	0.37	0.36	0.35	0.35	0.35	0.35	0.36	0.37	0.37
Palestine, Tex.	-0.033	0.55	0.54	0.54	0.53	0.52	0.51	0.51	0.51	0.52	0.53	0.54	0.54
Pensacola, Fla.	-0.038	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Philadelphia, Pa.	-0.013	0.12	0.12	0.12	0.12	0.11	0.11	0.11	0.11	0.11	0.11	0.12	0.12
Pike's Peak, Colo.	-0.010	12.69	12.71	12.58	12.27	12.05	11.81	11.77	11.78	11.97	12.27	12.65	12.65
Pittsburg, Pa.	-0.012	0.85	0.85	0.84	0.82	0.80	0.79	0.79	0.79	0.79	0.81	0.84	0.85
Poplar River, Mont.	+0.008	2.36	2.36	2.31	2.21	2.13	2.11	2.07	2.09	2.16	2.23	2.30	2.37
Port Huron, Mich.	-0.005	0.72	0.72	0.71	0.70	0.67	0.67	0.66	0.66	0.67	0.68	0.71	0.72
Portland, Me.	-0.004	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05
Portland, Oreg.	+0.002	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.08	0.08	0.08	0.08
Prescott, Ariz.	-0.023	5.41	5.39	5.37	5.25	5.12	5.04	5.01	5.00	5.12	5.18	5.37	5.40
Red Bluff, Cal.	-0.013	0.35	0.35	0.34	0.34	0.33	0.33	0.33	0.33	0.33	0.34	0.35	0.35
Rio Grande City, Tex.	-0.047	0.16	0.16	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.16	0.16
Rochester, N. Y.	-0.005	0.70	0.70	0.70	0.68	0.65	0.65	0.64	0.64	0.65	0.67	0.69	0.71
Roseburg, Oreg.	-0.005	0.55	0.55	0.55	0.54	0.54	0.53	0.53	0.53	0.53	0.54	0.55	0.55
Sacramento, Cal.	-0.017	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Saint Louis, Mo.	-0.017	0.63	0.62	0.62	0.60	0.58	0.58	0.57	0.57	0.58	0.60	0.62	0.63
Saint Michael's, Fort Alaska.	+0.047	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Saint Paul, Minn.	0.000	0.94	0.93	0.91	0.88	0.84	0.84	0.83	0.83	0.85	0.87	0.91	0.94
Saint Vincent, Minn.	+0.011	0.99	0.98	0.96	0.92	0.87	0.86	0.85	0.86	0.88	0.91	0.95	1.00
Salt Lake City, Utah.	-0.009	4.56	4.55	4.51	4.36	4.31	4.21	4.17	4.18	4.24	4.39	4.56	4.53
San Diego, Cal.	-0.033	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Sandusky, Ohio.	-0.010	0.71	0.71	0.71	0.69	0.66	0.66	0.65	0.65	0.66	0.68	0.71	0.72
Sandy Hook, N. J.	-0.012	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Sanford, Fla.	-0.041	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
San Francisco, Cal.	-0.019	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Santa Fé, N. Mex.	-0.019	7.00	7.00	6.90	6.75	6.62	6.50	6.42	6.41	6.56	6.70	6.85	6.91
Savannah, Ga.	-0.034	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.06	0.06	0.06	0.06	0.06
Shaw, Fort, Mont.	+0.005	3.87	3.86	3.81	3.68	3.61	3.58	3.52	3.54	3.62	3.71	3.83	3.84
Shreveport, La.	-0.033	0.22	0.22	0.21	0.21	0.20	0.20	0.20	0.20	0.20	0.21	0.21	0.22
Sill, Fort, Ind. T.	-0.025	1.30	1.28	1.26	1.21	1.19	1.17	1.17	1.17	1.19	1.23	1.28	1.30
Sitka, Alaska.	+0.032	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Smithville, N. C.	-0.029	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Spokane Falls, Wash.	+0.007	2.15	2.14	2.14	2.07	2.06	2.05	1.99	2.01	2.05	2.09	2.09	2.14
Springfield, Ill.	-0.014	0.70	0.69	0.68	0.66	0.65	0.64	0.63	0.64	0.65	0.66	0.68	0.70
Stockton, Fort, Tex.	-0.032	3.11	3.10	3.05	3.00	2.98	2.89	2.91	2.91	2.93	3.00	3.09	3.11
Tatoosh Island, Wash.	-0.009	0.11	0.11	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.11
Thomas, Fort, Ariz.	-0.029	2.80	2.80	2.75	2.70	2.64	2.60	2.56	2.59	2.61	2.68	2.81	2.79
Toledo, Ohio.	-0.009	0.73	0.73	0.72	0.70	0.68	0.67	0.67	0.67	0.67	0.69	0.72	0.73
Totten, Fort, Dak.	+0.008	1.78	1.76	1.73	1.67	1.60	1.57	1.55	1.56	1.60	1.65	1.72	1.81
Unalakshia, Alaska.	+0.024	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Vicksburg, Miss.	-0.033	0.23	0.23	0.23	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.23	0.23
Washington City.	-0.016	0.10	0.10	0.10	0.10	0.10	0.10	0.09	0.09	0.10	0.10	0.10	0.10
West Las Animas, Colo.	-0.016	4.11	4.10	4.05	3.93	3.83	3.75	3.73	3.72	3.80	3.91	4.09	4.18
Wilmington, N. C.	-0.029	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Winnemucca, Nev.	-0.009	4.54	4.53	4.50	4.40	4.33	4.25	4.18	4.21	4.29	4.42	4.52	4.56
Yankton, Dak.	-0.005	1.42	1.42	1.38	1.34	1.27	1.27	1.26	1.26	1.29	1.33	1.38	1.43
Yuma, Ariz.	-0.033	0.12	0.12	0.12	0.12	0.12	0.12	0.11	0.11	0.12	0.12	0.12	0.12

*Changes authorized since the beginning of the year 1885.*

Station.	Gravity correction.	Combined reduction constant (gravity and elevation) for each month.											
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Roseburg, Oreg. <sup>1</sup> .....	-0.006	0.57	0.57	0.57	0.56	0.56	0.55	0.55	0.55	0.55	0.56	0.57	0.57
Cincinnati, Ohio <sup>2</sup> .....	-0.016	0.69	0.69	0.68	0.66	0.64	0.64	0.63	0.63	0.64	0.65	0.68	0.69
Montrose, Colo. <sup>3</sup> .....	-0.017	6.00	6.00	5.98	5.75	5.63	5.50	5.46	5.47	5.60	5.76	5.96	6.02
Lamar, Mo. <sup>4</sup> .....	-0.020	1.13	1.13	1.12	1.08	1.05	1.04	1.03	1.03	1.05	1.08	1.11	1.13
Vicksburg, Miss. <sup>5</sup> .....	-0.033	0.24	0.24	0.24	0.23	0.23	0.23	0.23	0.23	0.23	0.24	0.24	0.24
Do <sup>6</sup> .....	-0.033	0.20	0.20	0.20	0.19	0.19	0.19	0.19	0.19	0.19	0.20	0.20	0.20
San Antonio, Tex. <sup>7</sup> .....	-0.040	0.80	0.80	0.79	0.77	0.76	0.75	0.75	0.75	0.76	0.77	0.79	0.80
Port Angeles, Wash. <sup>8</sup> .....	+0.008	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Portland, Me. <sup>9</sup> .....	-0.004	0.11	0.11	0.11	0.11	0.10	0.10	0.10	0.10	0.10	0.11	0.11	0.11
Saint Paul, Minn. <sup>1</sup> .....	0.000	0.97	0.96	0.94	0.91	0.87	0.87	0.86	0.86	0.88	0.90	0.94	0.97
San Luis Obispo, Cal. <sup>2</sup> .....	-0.026	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27
Concordia, Kans. <sup>3</sup> .....	-0.015	1.54	1.53	1.51	1.47	1.42	1.40	1.39	1.39	1.42	1.46	1.51	1.54

<sup>1</sup> To date from January 1, 1885.

<sup>2</sup> After removal March 1, 1885.

<sup>3</sup> New station.

<sup>4</sup> After removal April 21, 1885.

<sup>5</sup> After removal June 1, 1885.

<sup>6</sup> Station reopened.

<sup>7</sup> After removal July 1, 1885.

## APPENDIX 66 c.

*Latitude, longitude, and elevation of Signal Service barometers.*

[Prepared by Junior Professor H. A. Hazen.]

Station.	Latitude.	Longitude.	Elevation January 1, 1874.	Remarks.
	° /	° /	Feet.	
Albany, N. Y.....	42 39	73 45	75	Moved Oct. 1, 1884. H=83.
Alexander, Fort, Alaska.....	53 54	153 14		
Alpena, Mich.....	45 5	83 30	606	
Apache, Fort, Ariz.....	33 48	109 57	5,050 B	
Assiniboine, Fort, Mont.....	48 32	109 42	2,710 B	Moved March 12, 1884. H=2720 B.
Atlanta, Ga.....	33 45	84 23	1,129	
Atlantic City, N. J.....	39 22	74 25	13	
Augusta, Ga.....	33 28	81 54	183	
Baltimore, Md.....	39 18	76 37	45	
Barnegat, N. J.....	39 46	74 6	22	
Behring Island, Behring Sea.....	65 12	194 5	20	
Bennett, Fort, Dak.....	44 43	100 39	1,510 B	
Benton, Fort, Mont.....	47 50	110 40	2,604 B	Moved April 1, 1884. H=2681 B.
Bidwell, Fort, Cal.....	41 53	120 11		Established January 1, 1885.
Bismarck, Dak.....	46 47	100 38	1,694	
Block Island, R. I.....	41 10	71 36	27	
Boise City, Idaho.....	43 37	116 8	2,750 B	
Boston, Mass.....	42 21	71 4	142	Moved Oct. 1, 1884. H=125.
Bridge, Wyo.....	41 28	110 30	6,643 B	
Brownsville, Tex.....	25 53	97 26	59	Moved January 31, 1884. H=57.
Buffalo, N. Y.....	42 53	78 53	690	
Buford, Fort, Dak.....	48 0	103 56	1,930 B	
Cairo, Ill.....	37 0	89 10	359	See note at end.
Canby, Fort, Wash.....	46 16	124 4	179	
Cape Henry, Va.....	36 56	76 0	17	
Cape May, N. J.....	38 56	74 58	27	
Cape Mendocino, Cal.....	40 26	124 24	637	
Cedar Keys, Fla.....	29 8	83 2	22	
Charleston, S. C.....	32 47	79 56	52	
Charlotte, N. C.....	35 13	80 51	808	
Chattanooga, Tenn.....	35 4	85 15	783	
Cheyenne, Wyo.....	41 8	104 48	6,105	
Chicago, Ill.....	41 52	87 38	661	
Chincoteague, Va.....	37 55	75 23	14	Moved June 1, 1884. H=4.
Cincinnati, Ohio.....	39 6	84 30	612	Moved March 1, 1885. H=625
Cleveland, Ohio.....	41 20	81 42	690	
Colorado City, Tex.....	32 20	100 48		Established April, 1885.
Columbus, Ohio.....	39 58	83 0	812	

*Latitude, longitude, and elevation of Signal Service barometers—Continued.*

Station.	Latitude.	Longitude.	Elevation January 1, 1884.	Remarks.
	° /	° /	Feet.	
Concho, Fort, Tex.....	31 25	100 24	1,900 B	
Concordia, Kans.....	39 35	97 41		Established May 1, 1885. H=1384.
Custer, Fort, Mont.....	45 42	107 34	3,040 B	
Davenport, Iowa.....	41 30	90 28	615	
Davis, Fort, Tex.....	30 38	103 56	4,940	Moved March 3, 1884. H=4023 B.
Dayton, Wash.....	46 19	117 56	1,683 B	
Deadwood, Dak.....	44 23	103 43	4,600 B	
Delaware Break water, Del.....	38 48	75 10	20	
Denver, Colo.....	39 45	105 0	5,294	
Des Moines, Iowa.....	41 35	93 37	842	
Detroit, Mich.....	42 20	83 3	662	
Dodge City, Kans.....	37 45	100 0	2,517	
Dubuque, Iowa.....	42 30	90 44	665	
Duluth, Minn.....	46 48	92 6	687	Moved December 1, 1884. H=672.
Eastport, Me.....	44 54	66 59	61	
Elliott, Fort, Tex.....	36 30	100 21	2,650 B	
El Paso, Tex.....	31 47	106 20	3,764 B	
Erie, Pa.....	42 7	80 5	681	
Escanaba, Mich.....	45 48	87 5	612	Moved March 1, 1884. H=618.
Fort Smith, Ark.....	35 22	94 24	451	Moved February 1, 1885. H=470.
Frisco, Utah.....	38 25	113 16		Established January, 1885.
Galveston, Tex.....	29 18	94 47	40	
Grand Haven, Mich.....	43 5	86 18	620	
Grant, Fort, Ariz.....	32 39	109 57	4,860 B	Moved February 21, 1884. H=4856.
Greencastle, Ind.....	39 39	86 51	897	
Hatteras, N. C.....	35 15	75 40	12	
Helena, Mont.....	46 34	112 4	4,069	
Huron, Dak.....	44 21	98 9	1,305	
Indianapolis, Ind.....	39 46	86 10	766	
Indianola, Tex.....	28 32	96 31	26	
Jacksonville, Fla.....	30 20	81 39	43	
Keeler, Cal.....	36 35	117 50		Established February 1, 1885. Moved July 1, 1885. H=3622.
Keokuk, Iowa.....	40 22	91 26	618	
Key West, Fla.....	24 34	81 49	20	
Kitty Hawk, N. C.....	36 0	75 42	22	Moved November 1, 1884. H=9.
Knoxville, Tenn.....	35 56	83 58	960	
La Crosse, Wis.....	43 49	91 15	725	
Lamar, Mo.....	37 32	94 15		Established February 26, 1885. H=1028.
Leavenworth, Kans.....	39 19	94 57	842	
Lewiston, Idaho.....	46 8	117 5	780 B	Moved January 1, 1885. H=785 B.
Little Rock, Ark.....	34 45	92 6	298	Raised April 1, 1884. H=299.
Los Angeles, Cal.....	34 3	118 15	357	
Louisville, Ky.....	38 15	85 45	551	
Lynchburg, Va.....	37 25	79 9	652	
Mackinaw City, Mich.....	45 47	84 39	605	
Macon, Fort, N. O.....	34 42	76 40	11	
Maginnis, Fort, Mont.....	47 12	109 10	4,340 B	
Marquette, Mich.....	46 34	87 24	673	
Memphis, Tenn.....	35 9	90 3	320	
Milwaukee, Wis.....	43 2	87 54	697	
Mobile, Ala.....	30 41	88 2	41	Moved July 1, 1884. H=35.
Montgomery, Ala.....	32 23	86 18	219	
Montrose, Colo.....	38 30	107 56		Established December, 1884. H=5825.
Moorhead, Minn.....	46 52	96 44	926	
Mount Washington, N. H.....	44 16	71 18	6279	
Nashville, Tenn.....	36 10	86 47	549	
New Haven, Conn.....	41 18	72 56	107	
New London, Conn.....	41 21	72 5	47	
New Orleans, La.....	29 58	90 4	52	
New York, N. Y.....	40 43	74 0	164	
Norfolk, Va.....	36 51	76 17	30	
North Platte, Nebr.....	41 8	100 45	2,841	
Olympia, Wash.....	47 3	122 53	36	
Omaha, Nebr.....	41 16	95 56	1,113	
Oswego, N. Y.....	43 29	76 35	304	Moved August 1, 1884. H=335.
Palestine, Tex.....	31 45	95 40	533	
Pensacola, Fla.....	30 25	87 13	30	
Philadelphia, Pa.....	39 57	75 9	92	Moved April 1, 1884. H=117.
Pike's Peak, Colo.....	38 50	105 2	14,134	
Pittsburg, Pa.....	40 32	80 2	771	
Poplar River, Mont.....	48 8	105 10	2,080 B	
Port Angeles, Wash.....	48 7	123 6		Established February 1, 1885. H=14.
Port Huron, Mich.....	43 0	82 26	633	
Portland, Me.....	43 39	70 15	45	Moved July 1, 1885. H=99.

*Latitude, longitude, and elevation of Signal Service barometers—Continued.*

Station.	Latitude.	Longitude.	Elevation January 1, 1884.	Remarks.
	° /	° /	Feet.	
Portland, Oreg.....	45 32	122 43	67	
Prescott, Ariz.....	34 33	112 28	5,340 B	Moved March 19, 1884. H=5,289 B.
Provincetown, Mass.....	42 3	70 11	26	Discontinued March 26, 1884.
Red Bluff, Cal.....	40 10	122 15	337	
Rio Grande City, Tex.....	26 23	98 48	230 B	
Rochester, N. Y.....	43 8	77 42	621	
Roseburg, Oreg.....	43 13	123 20	511	Moved August 22, 1884. H=523.
Sacramento, Cal.....	38 35	121 30	65	Moved February 1, 1884. H=64.
Saint Louis, Mo.....	38 38	90 13	571	
Saint Michael's, Fort, Alaska.....	63 28	161 48	30	
Saint Paul, Minn.....	44 58	93 3	801	
Saint Vincent, Minn.....	48 56	97 14	804	
Salt Lake City, Utah.....	40 46	111 54	4,348	
San Antonio, Tex.....	29 27	98 28	.....	Re-established March 7, 1885. H=781.
San Diego, Cal.....	32 43	117 10	67	
Sandusky, Ohio.....	41 25	82 40	688	
Sandy Hook, N. J.....	40 28	74 00	28	
Sanford, Fla.....	28 48	81 23	50 B	Moved August 1, 1884. H=35 B.
San Francisco, Cal.....	37 48	122 26	60	
San Luis Obispo, Cal.....	35 18	120 39	.....	Established June 1, 1885. H=270.
Santa Fé, N. Mex.....	35 41	105 57	.....	Re-estab. Dec. 1, 1884. H=7028.
Savannah, Ga.....	32 5	81 5	87	
Shaw, Fort, Mont.....	47 31	111 48	3,550 B	
Shreveport, La.....	32 30	93 40	227	
Still, Fort, Ind. T.....	34 40	98 23	1,300 B	
Sitka, Alaska.....	57 3	135 19	63	
Smithville, N. C.....	33 55	78 1	34	
Spokane Falls, Wash.....	47 40	117 25	1,906	Moved December 1, 1884. H=1909.
Springfield, Ill.....	39 48	89 39	644	
Stanton, Fort, N. Mex.....	33 30	105 26	.....	Established January, 1885.
Stockton, Fort, Tex.....	30 53	102 53	3,010 B	
Tatoosh Island, Wash.....	48 23	124 44	86	
Thomas Camp, Ariz.....	33 4	110 2	2,710 B	
Toledo, Ohio.....	41 40	83 24	651	
Totten, Fort, Dak.....	47 57	98 57	.....	Established May, 1884, H=1,500.
Unalaska, Alaska.....	53 53	166 32	13	
Valentine, Nebr.....	42 50	100 32	.....	Established April 21, 1885.
Vicksburg, Miss.....	32 22	90 53	244	New office, April 21, 1885. H=232. Moved June 1, 1885. H=209.
Washington City.....	38 54	77 3	106	
West Las Animas, Colo.....	38 4	108 12	3,899	
Wilmington, N. C.....	34 14	77 57	52	
Winnemucca, Nev.....	40 58	117 43	.....	Re-established December 1, 1884. H=4358.
Yankton, Dak.....	42 54	97 28	1,228	
Yuma, Ariz.....	32 45	114 36	141	

NOTE.—It will be noted that the elevation of the following stations differs from that in the last report by the amount set against each. Cairo, 18 feet; Cincinnati, 8; Indianapolis, 13; Louisville, 21; and St. Louis, 12. These changes are not due to a removal of office, but to a redetermination of the altitude by carefully connecting with the line of precise levels being run by the United States Coast and Geodetic Survey across the Continent from Sandy Hook to the Pacific.

The case of Cincinnati is especially instructive. The former elevation depended on a large number of canal and railroad levels, all of which appeared to check within a foot and yet the final result was in error by 8 feet. The difference of 29 feet between Louisville and Cincinnati has been noticed even in the reductions of barometer readings for the isobars on the daily maps.

When this line of levels has been completed, it will afford a most important base from which we may obtain elevations on either side and at many points where great uncertainties exist at present.

## APPENDIX 66 D.

*List of tornado reporters, June 30, 1885.*

Name.	Post-office.	County.	State or Territory.
W. E. DeLap.	Boscobel	Grant	Wisconsin.
Suel Foster.	Muscatine	Muscatine	Iowa.
W. S. Dennet.	Saco	York	Maine.
John J. Hubbley.	Menokaunee	Marquette	Wisconsin.
George Carrington.	West Winsted	Litchfield	Connecticut.
Hervey Barber.	Warwick	Franklin	Massachusetts.
J. C. Whitmore.	Cordova	Rock Island	Illinois.
W. R. Gregg.	Camden	Lyon	Minnesota.
C. W. Parsons.	Providence	Providence	Rhode Island.
O. A. Archer.	Blackington	Berkshire	Massachusetts.
Howard C. Lewis.	Mount Holly	Burlington	New Jersey.
W. H. Higgins.	Grant City	Sac	Iowa.
J. F. Lewellyn.	Mexico	Andrain	Missouri.
O. P. Baer.	Richmond	Wayne	Indiana.
Henry J. Grannis.	High Forest	Olmstead	Minnesota.
Charles Kirchner.	Waumandee	Buffalo	Wisconsin.
Clarence Gardner.	Burlington	Des Moines	Iowa.
A. H. Peterson.	Bath	Freeborn	Minnesota.
H. S. Terry.	Utica	Winona	Do.
F. L. Sandford.	Independence	Buchanan	Iowa.
R. W. Putnam.	Ypsilanti	Washtenaw	Michigan.
J. W. Perkins.	New Chester	Adams	Wisconsin.
Alexander Paul.	Patch Grove	Grant	Do.
R. P. Colt.	Poy Sippi	Waushara	Do.
George S. Card.	Daisy	Hamilton	Tennessee.
H. Besse, Jr.	Butternut	Ashland	Wisconsin.
C. Keckley.	Hillsborough	Fleming	Kentucky.
A. Norellins.	Kiron	Crawford	Iowa.
John D. Dopf.	Rockport	Atchison	Missouri.
Isaac H. Adams.	Scranton	Green	Iowa.
Messrs. Webster and Corning.	Briggsville	Marquette	Wisconsin.
Prof Henry M. McFarland.	Hyde Park	Lamolle	Vermont.
R. J. Spurr.	Greendale	Fayette	Kentucky.
Israel S. Scott.	Kirk's Ferry P. O.	Catahoula Parish	Louisiana.
Edwin L. Childs.	Crete	Saline	Nebraska.
J. Sidner, Jr.	Loradale	Fayette	Kentucky.
Olef Olson.	Deer Park	Saint Croix	Wisconsin.
Paul Roulet.	Drury College, North Springfield.	Green	Missouri.
N. L. Smith.	Centralla	Boone	Do.
William H. Pomeroy.	Edgerton	Rock	Wisconsin.
James Amy.	Saint Joseph	Texas	Louisiana.
D. W. Briggs.	Mount Sterling	Crawford	Wisconsin.
William M. Taylor.	Herndon	Saline	Missouri.
G. H. Kallmeyer.	Best Bottom	Montgomery	Do.
B. F. Ferris.	Sunman	Ripley	Indiana.
W. B. Goodrich.	Bingham	Somerset	Maine.
Joseph Luce.	Pueblo	Pueblo	Colorado.
Irvine Prather.	Russell Cave	Fayette	Kentucky.
W. H. Scofield.	Cannon River Falls	Goodhue	Minnesota.
D. P. Davis, Jr.	South Bend	Blue Earth	Do.
Rev. A. A. Young.	New Lisbon	Juneau	Wisconsin.
O. G. Wall.	Lanesborough	Fillmore	Minnesota.
M. C. Thompson.	Waverly	Pierce	Wisconsin.
E. P. Stearns.	Etter	Dakota	Minnesota.
N. B. McKay.	American City	Nemaha	Kansas.
P. W. Sears.	Moravia	Appanoose	Iowa.
E. Silverberg.	Peach Orchard	Clay	Arkansas.
C. G. Parker.	Mount Vernon	Franklin	Texas.
T. E. Jenkins.	Dawn	Livingston	Missouri.
E. G. Hubbell.	Pittsfield	Berkshire	Massachusetts.
E. A. Goodnough.	Oneida	Brown	Wisconsin.
H. W. Smith.	Adair	Adair	Iowa.
J. C. Hatch.	Loyd	Richland	Wisconsin.
T. Jewell.	Star Prairie	Saint Croix	Wisconsin.
W. W. Moore.	Gillett	Clay	Iowa.
T. A. Smith.	Beloit	Rock	Wisconsin.
M. C. Waite.	Baraboo	Sauk	Do.
W. E. Hull.	Prior Lake	Scott	Minnesota.
E. L. Berthoud.	Golden	Jefferson	Colorado.
B. Craig.	Versailles	Woodford	Kentucky.
J. G. Lawton.	De Pere	Brown	Wisconsin.
S. B. Rittenhouse.	Reading	Berks	Pennsylvania.
S. M. Locke.	Rockbury	Oxford	Maine.
J. S. Gerald.	Beaver Falls	Renville	Minnesota.
August Sweger.	Avalanche	Vernon	Wisconsin.
E. J. Gilkey.	Strong	Franklin	Maine.

*List of tornado reporters, June 30, 1885—Continued.*

Name.	Post-Office.	County.	State or Territory.
Wilder Pratt	Freeman	Franklin	Maine.
A. Patrick	Grand Marsh	Adams	Wisconsin.
Rachael Larrabee	McGregor	Clayton	Iowa.
G. W. McDonald	Monticello	Wright	Minnesota.
J. J. Palmer	City Point	George	Virginia.
John Janzen	Mountain Lake	Cottonwood	Minnesota.
Arthur J. Carroll	Plainview	Wabasha	Do.
Henry Tucker	Otto	Clark	Indiana.
E. D. Winchester	Stacyville	Mitchell	Iowa.
Reuben Adams	Hersey	Saint Croix	Wisconsin.
William B. Pratt	Prattsburgh	Steuben	New York.
M. F. Billingsley	Franklin	Izard	Arkansas.
H. W. Pickens	Atalla	Etowah	Alabama.
John R. King	Island Lake	Lyon	Minnesota.
W. L. Wilkinson	Tettington	Charles City	Virginia.
E. D. Henry	Omo	Winnebago	Wisconsin.
J. S. Towle	New Avon	Redwood	Minnesota.
T. V. Munson	Dennison City	Grayson	Texas.
T. C. Craig	Easton	Leavenworth	Kansas.
O. Knight	Glendale	Henrico	Virginia.
G. B. Holden	Bacon	Monroe	Wisconsin.
Henry C. Terrell	Elmwood	Saline	Missouri.
William Welsh	Loyal	Clark	Wisconsin.
R. H. Kirk	Oxford	Chester	Pennsylvania.
C. L. Fellows	Fascoro	Kewaunee	Wisconsin.
John A. Wood	Rock Branch	Woodbury	Iowa.
William Smith	Marshfield	Webster	Missouri.
M. M. Beck	Holton	Jackson	Kansas.
R. B. Boulton	Millersburgh	Bourbon	Kentucky.
John Ingleby	Potsdam	Olmstead	Minnesota.
I. J. Wheeler	Monona	Clayton	Iowa.
J. G. Brandon	Poughkeepsie	Sharp	Arkansas.
Enoch L. Fogg	Woodstown	Salem	New Jersey.
J. L. Stowell	Bell Centre	Crawford	Wisconsin.
E. A. A. Morse	Gainesville	Sumpter	Alabama.
W. R. Allen	Pitman	Clay	Arkansas.
H. B. Wilson	Red Wing	Goodhue	Minnesota.
B. F. Jones	Beauregard	Copiah	Mississippi.
James H. Maxwell	Worthington	Nobles	Minnesota.
C. K. Baxter	Wells	Faribault	Do.
C. G. Witherspoon	Marystown	Johnson	Texas.
W. B. Clark	Beebe	White	Arkansas.
J. K. Gardner	New Hampton	Chickasaw	Iowa.
D. W. McNeal	Wendell	Cherokee	Do.
J. J. Webb	Fairview	Brown	Kansas.
W. A. Paddock	Ackerland	Leavenworth	Do.
W. D. Akers	Spring Valley	Pierce	Wisconsin.
George Stockmeyer	Fort Scott	Bourbon	Kansas.
H. A. Swain	Union Lake	Rice	Minnesota.
A. Patterson	Lee	Carter	Missouri.
D. L. Beaver	Reading	Berks	Pennsylvania.
J. O. Olen	Freedom	Wasca	Minnesota.
H. C. Rawson	Sturgis	Saint Joseph	Michigan.
Prof. H. E. Sadler	Emporia	Lyon	Kansas.
Edgar W. Clarke	Irvington	Washington	Illinois.
Robert O. Schoenfeleer	Wellington	Renville	Minnesota.
W. G. Eartley	Birch Cooley	do	Do.
A. E. Dolbear	College Hill	Middlesex	Massachusetts.
B. S. Hoxie	Albany	Green	Wisconsin.
E. O. Brauna	Tracy	Lyons	Minnesota.
J. H. Fawcett	Marion	Olmstead	Do.
John H. McGillan	Mackville	Outagamie	Wisconsin.
J. W. Dawson	Redfield	Spink	Dakota.
John Antry	Albertha	Randolph	Arkansas.
T. J. Reeves	Seney	Plymouth	Iowa.
P. Clawson	O'Keana	Rutler	Ohio.
Arthur Borger	Wilson	Niagara	New York.
Henry M. Crombie	Glasgow	Trempealeau	Wisconsin.
D. F. Akin	Farmington	Dakota	Minnesota.
W. C. Talley	Marble Hill	Bollinger	Missouri.
James A. Shanker	Beaver Creek	Rock	Minnesota.
Martiu Bischoff	Buffalo	Erie	New York.
Henry D. A. Ward	Middletown	Middlesex	Connecticut.
S. W. Morrison	Oxford	Chester	Pennsylvania.
A. P. Jones	Little Wolf	Waupaca	Wisconsin.
E. A. Jones	Massillon	Stark	Ohio.
John L. Meagher	Marysburg	Le Sueur	Minnesota.
Frank Tilton	Green Bay	Brown	Wisconsin.
Charles G. Robinson	Campbellsburg	Washington	Indiana.
Frank J. Wisc	Pine Bluff	Jefferson	Arkansas.
M. E. Paynter	Midway	Woodford	Kentucky.
John Alvey	Delavan	Fairbault	Minnesota.
A. W. Green	Greenville	Clay	Iowa.

*List of tornado reporters, June 30, 1885—Continued.*

Name.	Post-office.	County.	State or Territory.
Prof. P. K. Pattison .....	Westfield .....	Chautauqua .....	New York.
C. N. Sawyer .....	Pattersonville .....	Sioux .....	Iowa.
E. C. Hildreth .....	Wheeling .....	Ohio .....	West Virginia.
John C. Whiteside .....	Loutre Island .....	Montgomery .....	Missouri.
Edwin H. Cox .....	Pekin .....	Niagara .....	New York.
Rev. F. M. Eckstein .....	Conception .....	Nodaway .....	Missouri.
Robert Lynn .....	Acton .....	Pembina .....	Dakota.
Charles G. Boernor .....	Vevay .....	Switzerland .....	Indiana.
G. F. Hunter .....	Hawarden .....	Sioux .....	Iowa.
Walter S. Booth .....	Minneapolis .....	Hennepin .....	Minnesota.
Mrs. B. W. Randall .....	Sharon .....	Le Sueur .....	Do.
C. M. Widman .....	Grand Coteau .....	Saint Landry .....	Louisiana.
T. M. Barton .....	Butler .....	Pendleton .....	Kentucky.
C. Shaler Smith .....	Saint Louis .....	Saint Louis .....	Missouri.
George Durkee .....	De Forest .....	Dane .....	Wisconsin.
K. M. Hutchinson .....	Oshkosh .....	Winnebago .....	Do.
J. N. Prouty .....	Humboldt .....	Humboldt .....	Iowa.
William Prescott .....	Bear Valley .....	Wabasha .....	Minnesota.
A. I. Druke .....	Cascade .....	Goodhue .....	Do.
John De Boos .....	Bigelow .....	Nobles .....	Do.
C. H. Honey .....	Kensington .....	Walsh .....	Dakota.
Charles J. Ellis .....	Marinette .....	Marinette .....	Wisconsin.
F. M. Green .....	Whiting .....	Jackson .....	Kansas.
E. Whitcomb .....	Friend .....	Saline .....	Nebraska.
Albert Campbell .....	Adrian .....	Nobles .....	Minnesota.
James Reed .....	Avalon .....	Livingston .....	Missouri.
C. Steffens .....	Fraser .....	Macomb .....	Michigan.
A. Gould .....	Spring Lake .....	Kingsbury .....	Dakota.
John O'Bryan .....	Garfield .....	Jackson .....	Wisconsin.
N. M. Cook .....	729 Eleventh avenue, N. Minneapolis.	Hennepin .....	Minnesota.
D. H. Morgan .....	Albany .....	Green .....	Wisconsin.
R. W. Nell .....	Nevada .....	Mercer .....	Kentucky.
James H. Haight .....	Lowville .....	Columbia .....	Wisconsin.
L. P. Miller .....	High Hill .....	Montgomery .....	Missouri.
George Fairfield .....	Bridgeport .....	Crawford .....	Wisconsin.
W. S. Prather .....	North Vernon .....	Jennings .....	Indiana.
A. D. Bundy .....	Saint Ansgar .....	Mitchell .....	Iowa.
F. Frederick .....	Cross Plains .....	Dane .....	Wisconsin.
J. C. Risk .....	Canton .....	Lewis .....	Missouri.
John H. Brown .....	Fair Water .....	Fond du Lac .....	Wisconsin.
Henry Schildt .....	Mazo Manic .....	Dane .....	Do.
E. F. Lewis .....	Lewiston .....	Columbia .....	Do.
Emma M. Smith .....	Mendota .....	Dane .....	Do.
J. C. Fales .....	Danville .....	Boyles .....	Kentucky.
J. M. Elder .....	Concord .....	Hancock .....	Iowa.
Charles A. Kendall .....	Barry .....	Pike .....	Illinois.
John Regan .....	Elmwood .....	Peoria .....	Do.
Alexander Hawkin .....	West Newton .....	Nicollet .....	Minnesota.
Thomas J. Felzer .....	Enterprise .....	Winona .....	Do.
G. H. Yapp .....	Waucousta .....	Fond du Lac .....	Wisconsin.
Andrew W. Pederson .....	Comfrey .....	Brown .....	Minnesota.
C. H. Benton .....	Dodge Centre .....	Dodge .....	Do.
John Collet .....	Indianapolis .....	Marion .....	Indiana.
J. Shaw .....	Chester .....	Olmstead .....	Minnesota.
Joseph Boyd .....	Oskaloosa .....	Mahaska .....	Iowa.
E. A. Hickman .....	Independence .....	Jackson .....	Missouri.
C. P. Parsons .....	Spaulding .....	Hamlin .....	Dakota.
J. F. Martin .....	Efingham .....	Atholson .....	Kansas.
G. A. Goff, Jr. .....	Elmira .....	Chemung .....	New York.
George S. Barnes .....	Handy .....	Rock .....	Minnesota.
Erasmus Haworth .....	Oskaloosa .....	Mahaska .....	Iowa.
Nathaniel Shute .....	Exeter .....	Rockingham .....	New Hampshire.
E. Tracy Brown .....	Hanover .....	Rock .....	Wisconsin.
F. H. King .....	River Falls .....	Pierce .....	Do.
A. M. Carter .....	Johnstown .....	Rock .....	Do.
H. M. Weston .....	Greenwood .....	Clark .....	Do.
P. E. Orear .....	Orearville .....	Saline .....	Missouri.
E. Hildebrand .....	Philadelphia .....	Philadelphia .....	Pennsylvania.
Mrs. P. H. Mell .....	Auburn .....	Lee .....	Alabama.
Oscar J. Lawrence .....	Arlington .....	Tarrant .....	Texas.
E. A. Gore .....	Marshall .....	Lyon .....	Minnesota.
Peter Wodzynski .....	Stoddard .....	Vernon .....	Wisconsin.
George R. Cathler .....	Ashville .....	Saint Clair .....	Alabama.
C. G. Edwards .....	Spring Valley .....	Fillmore .....	Minnesota.
William J. Waggoner .....	Viola .....	Richland .....	Wisconsin.
E. S. Mitchell .....	Tigerton .....	Shawano .....	Do.
R. S. Morse .....	Beetown .....	Grant .....	Do.
George Davy .....	Ottawa .....	Waukesha .....	Do.
A. F. Berry .....	Springville .....	Lawrence .....	Indiana.
S. N. Kingsley .....	Loganville .....	Sauk .....	Wisconsin.
Mrs. J. Campbell .....	Sibley .....	Osoeola .....	Iowa.
John T. Bedally .....	Trim Belle .....	Pierce .....	Wisconsin.

*List of tornado reporters, June 30, 1885—Continued.*

Name.	Post-office.	County.	State or Territory.
G. B. Brackett.....	Denmark.....	Lee.....	Iowa.
H. P. Hanson.....	Haywood.....	Freeborn.....	Minnesota.
J. H. J. Williams.....	Doran's Cave.....	Jackson.....	Alabama.
E. F. Test.....	Omaha.....	Douglas.....	Nebraska.
Spencer Haines.....	Rancocas.....	Burlington.....	New Jersey.
James B. Wallace.....	Mount Pleasant.....	Westmoreland.....	Pennsylvania.
J. Reimers.....	Calumet Harbor.....	Fond du Lac.....	Wisconsin.
Abraham Vines.....	Vine's Springs.....	Ripley.....	Indiana.
J. B. Porter.....	Silver Creek.....	Floyd.....	Georgia.
W. B. Strong.....	Northfield.....	Rice.....	Minnesota.
Daniel James.....	Yarnallton.....	Fayette.....	Kentucky.
E. M. Shepard.....	Springfield.....	Green.....	Missouri.
Robert Severs.....	Washington Harbor.....	Door.....	Wisconsin.
Ellwood Cooper.....	Santa Barbara.....	Santa Barbara.....	California.
Edward Newhouse.....	Edwards.....	Sheboygan.....	Wisconsin.
C. Bonnin.....	Bondnel.....	Shawano.....	Do.
L. Stowe.....	Sun Prairie.....	Dane.....	Do.
J. T. Davenport.....	Whitesburg.....	Carroll.....	Georgia.
Thomas L. Wakeley.....	Germania.....	Calhoun.....	Alabama.
J. J. B. McElrath.....	Centre.....	Cherokee.....	Do.
E. K. Memminger.....	17 Broad st., Charles- ton.....	Charleston.....	South Carolina.
Colin Macrar.....	Camden.....	Kershaw.....	Do.
J. S. Stewart.....	Oxford.....	Newton.....	Georgia.
R. L. Rhodes.....	Hephzibah.....	Richmond.....	Do.
Henry D. Capers.....	Adairville.....	Barton.....	Do.
W. M. Chapel.....	Kingston.....	Green Lake.....	Wisconsin.
George H. Larison.....	Lambertville.....	Hunterson.....	New Jersey.
K. C. Pope.....	Battleborough.....	Edgecombe.....	North Carolina.
George L. De Hines.....	Hope Station.....	Lexington.....	South Carolina.
E. Parsons.....	Dallas.....	Gaston.....	North Carolina.
T. G. Patrick.....	White Oak.....	Fairfield.....	South Carolina.
H. F. Walker.....	Jackson Station.....	Aiken.....	Do.
John T. Hardie.....	67 Carondelet street.....	New Orleans.....	Louisiana.
Levi Clippinger.....	Centralia.....	Nemaha.....	Kansas.
Albert Rawlins.....	Eastland.....	Eastland.....	Texas.
A. I. Laing.....	Dale.....	Cottonwood.....	Minnesota.
J. H. Brownlee.....	Plainsville.....	Gordon.....	Georgia.
John Minor.....	Sun Hill.....	Washington.....	Do.
John C. Glover.....	Batesburg.....	Lexington.....	South Carolina.
W. F. Brewer.....	Duluth.....	Gwinnett.....	Georgia.
Mary R. Dusenberg.....	Concord.....	Cabarrus.....	North Carolina.
G. P. Harley.....	Allendale.....	Barnwell.....	South Carolina.
W. H. Hatfield.....	Hollywood.....	Richland.....	Georgia.
D. L. Cheatham.....	Davidaborough.....	Washington.....	Do.
Grace G. Cochran.....	Anderson.....	Anderson.....	South Carolina.
J. M. Bivins.....	Albemarle.....	Stanley.....	North Carolina.
W. J. Goss.....	Harmony Grove.....	Jackson.....	Georgia.
E. McRae.....	Wadesborough.....	Anson.....	North Carolina.
James E. Crossland.....	Aiken.....	Aiken.....	South Carolina.
V. B. Clark.....	Blountsville.....	Jones.....	Georgia.
I. Holt.....	Siluria.....	Shelby.....	Alabama.
N. A. Whitmore.....	Canton.....	Cherokee.....	Georgia.
J. K. Milner.....	Columbiana.....	Shelby.....	Alabama.
James Smith.....	Lexington.....	Davidson.....	North Carolina.
D. A. Jordan.....	Jackson.....	Northampton.....	Do.
William T. Hamilton.....	Talking Rock.....	Pickens.....	Georgia.
E. Rumble.....	Gogginsville.....	Monroe.....	Do.
Sampson Pope.....	Newberry.....	Newberry.....	South Carolina.
W. C. Rose.....	Timmons ville.....	Darlington.....	Do.
John H. Frick.....	Warrenton.....	Warren.....	Missouri.
J. M. Pugh.....	Morrisville.....	Wake.....	North Carolina.
O. S. Jones.....	Manly.....	Moore.....	Do.
Thomas W. Halloway.....	Pomaria.....	Newberry.....	South Carolina.
James A. Dunlap.....	Cedar Hill.....	Anson.....	North Carolina.
Mrs. H. N. Sutton.....	Big Creek.....	Forsyth.....	Georgia.
M. H. Allen.....	Beverly.....	Anson.....	North Carolina.
J. H. Hendly.....	Ansonville.....	Anson.....	Do.
H. H. Guernsey.....	Altamont.....	Deuel.....	Dakota.
D. F. Waite.....	Byron.....	Houston.....	Georgia.
E. A. S. Mixon.....	Barnwell.....	Barnwell.....	South Carolina.
James H. Paw.....	Smithfield.....	Johnston.....	North Carolina.
L. H. Boyken.....	Brooks' Station.....	Fayette.....	Georgia.
T. J. Gray.....	Choctaw Agency.....	Oktibbeha.....	Mississippi.
Dr. William W. Twitty.....	Camilla.....	Mitchell.....	Georgia.
Professor J. E. Davies.....	Madison.....	Dane.....	Wisconsin.
J. N. Garrison.....	Gillsville.....	Banks.....	Georgia.
W. W. Crosby.....	Crosbyville.....	Chester.....	South Carolina.
John W. Lutz.....	Cave Springs.....	Bullitt.....	Kentucky.
R. A. Gohar.....	Dougherty.....	Dawson.....	Georgia.
R. R. Irby.....	Linton.....	Hancock.....	Do.
C. Lightfoot.....	Pellham.....	Mitchell.....	Do.
W. J. Y. Thurston.....	Clayton.....	Johnston.....	North Carolina.



*List of tornado reporters, June 30, 1885—Continued.*

Name.	Post-office.	County.	State or Territory.
A. M. McMullen.....	Landsford.....	Chester.....	South Carolina.
Richard L. Rowe.....	Rock Valley.....	Sloux.....	Iowa.
J. A. Parham.....	Lockville.....	Chatham.....	North Carolina.
R. B. McArver.....	Coosa.....	Floyd.....	Georgia.
William M. Jones.....	Cary.....	Wake.....	North Carolina.
J. C. Goodman.....	Goodman.....	Anson.....	Do.
J. S. Stewart, jr.....	Cave Spring.....	Floyd.....	Georgia.
Jackson Counts.....	Peak.....	Lexington.....	South Carolina.
B. F. Benton.....	Raymond.....	Union.....	North Carolina.
C. C. Chandler.....	Bascobel.....	Jackson.....	Georgia.
Alexander A. Beard.....	Wilsonville.....	Spencer.....	Kentucky.
W. C. Baskins.....	Coats Bend.....	Etowah.....	Alabama.
C. Martin.....	Martin's Cross Roads.....	Calhoun.....	Do.
A. S. Marsh.....	Harrisburg.....	Saline.....	Illinois.
Charles De St. Roseana.....	Augusta.....	Richmond.....	Georgia.
James McFarlane.....	Towanda.....	Bradford.....	Pennsylvania.
J. M. Head, jr.....	Linwood.....	Pike.....	Alabama.
W. B. Spencer.....	Murfreesborough.....	Hertford.....	North Carolina.
S. Pierson.....	Enfield.....	Halifax.....	Do.
F. J. Blackwell.....	Lavonia.....	Franklin.....	Georgia.
W. Nelson.....	Smith's Turn Out.....	York.....	South Carolina.
John Goodrich.....	Enfield.....	Halifax.....	North Carolina.
W. F. Watson.....	Watsonville.....	Rowan.....	Do.
R. C. Alexander.....	Homer.....	Banks.....	Georgia.
R. M. Raymond.....	Hailes Gold Mine.....	Lancaster.....	South Carolina.
J. M. Campbell.....	Oak Grove.....	Union.....	North Carolina.
Henry S. Glover.....	Monticello.....	Jasper.....	Georgia.
W. B. Smith.....	Tumbling Shoals.....	Laurens.....	South Carolina.
Marvel Ritchie.....	Copal Grove.....	Stanley.....	North Carolina.
M. F. Huntley.....	Lane's Creek.....	Union.....	Do.
J. T. Rose.....	Indian Trail.....	do.....	Do.
S. Buckley.....	New Providence.....	Montgomery.....	Tennessee.
Arthur Harvin.....	Oakland.....	Clarendon.....	South Carolina.
C. W. Stanton.....	Elk City.....	Montgomery.....	Kansas.
R. J. Harper.....	Sandy Ridge.....	Henry.....	Georgia.
W. H. S. Harris.....	Jonesville.....	Union.....	South Carolina.
G. H. Hannah.....	South Bosque.....	McLennan.....	Texas.
James C. Klugh.....	Abbeville.....	Abbeville.....	South Carolina.
J. W. Majors.....	Majors.....	Anderson.....	Do.
J. J. Talley.....	Lovelace.....	Troup.....	Georgia.
Ansel Strickland.....	Cummings.....	Forsyth.....	Do.
Thad C. Sturgis.....	Columbus.....	Muscogee.....	Do.
Chas. Nickerson.....	Big Creek.....	Edgefield.....	South Carolina.
John W. Caldwell.....	Clarksville.....	Montgomery.....	Tennessee.
J. A. Keller.....	Tunnel Hill.....	Hardin.....	Kentucky.
C. E. Bessey.....	Ames.....	Storey.....	Iowa.
Edward B. Smith.....	Smithsborough.....	Jasper.....	Georgia.
I. Varenberg.....	Paint Rock.....	Jackson.....	Alabama.
H. Good.....	Marietta.....	Greenville.....	South Carolina.
J. M. Dorsey.....	Massey Creek.....	White.....	Georgia.
R. W. Boyd.....	Darlington.....	Darlington.....	South Carolina.
Thos. B. Dedrer.....	Little Warrior.....	Blount.....	Alabama.
Edgar L. Larkin.....	New Windsor.....	Mercer.....	Illinois.
James O. Ladd.....	Cheraw.....	Chesterfield.....	South Carolina.
B. C. Smith.....	Cold Water.....	Elbert.....	Georgia.
I. A. Ledbetter.....	Edinborough.....	Montgomery.....	North Carolina.
W. F. Brookshine.....	Powelson.....	Richmond.....	Do.
E. W. Griffith.....	Ozark.....	Dale.....	Alabama.
L. M. Burkett.....	Pine Ridge.....	Twiggs.....	Georgia.
T. W. Methvin.....	Senola.....	Coweta.....	Do.
P. D. Huff.....	Saint Albans.....	Greenville.....	South Carolina.
J. R. Culp.....	Rossville.....	Chester.....	Do.
William Gesner.....	Birmingham.....	Jefferson.....	Alabama.
William Bradley.....	Mapleton.....	Abbeville.....	South Carolina.
C. E. Greene.....	Long Cane.....	Troup.....	Georgia.
J. J. Bunch.....	Poverty Hill.....	Edgefield.....	South Carolina.
D. C. Hodo.....	Carrollton.....	Pickens.....	Alabama.
W. H. Jones.....	Ringwood.....	Halifax.....	North Carolina.
Charles S. Prosser.....	Ithaca.....	Tompkins.....	New York.
P. P. Maxwell.....	Davidson College.....	Mecklenburgh.....	North Carolina.
John M. Vean.....	Neillsville.....	Clark.....	Wisconsin.
George H. Carter.....	Carter's Mills.....	Moore.....	North Carolina.
Charles D. Chappell.....	Jenkinsville.....	Fairfield.....	South Carolina.
W. T. Holland.....	Marlon Station.....	Lauderdale.....	Mississippi.
H. D. Ingersoll.....	Dahlonga.....	Lumpkin.....	Georgia.
C. B. La Hattie.....	Gainesville.....	Hall.....	Do.
R. P. Collins.....	Hanrahan.....	Pitt.....	North Carolina.
W. S. Sanford.....	Livingston.....	Floyd.....	Georgia.
Jer. S. Bmy.....	Foust's Mills.....	Randolph.....	North Carolina.
D. H. Hepler.....	Hannersville.....	Davidson.....	Do.
W. P. Coker.....	Cedar Grove.....	Laurens.....	South Carolina.
J. B. Wright.....	High Tower.....	Forsyth.....	Georgia.
Jacob W. Whorton.....	Forney.....	Cherokee.....	Alabama.

*List of tornado reporters, June 30, 1885—Continued.*

Names.	Post-office.	County.	State or Territory.
Josiah E. Pridgen	Key	Cherokee	Alabama.
John B. Boyd	Sonora	Gordon	Georgia.
George B. Tilton	Aurora	Kane	Illinois.
Irvin P. Smith	Lansing	Ingham	Michigan.
J. A. Salter	Crawford	Lowndes	Mississippi.
W. A. Ellington	Beaumont	Chatham	North Carolina.
James L. Strain	Etta Jane	Union	South Carolina.
E. E. Barnard	Vanderbilt University.	Nashville.	Tennessee.
T. J. Lake	Athens	Limestone	Alabama.
A. J. Phinney	Muncie	Delaware	Indiana.
F. J. Hay	Liberty Hill	Kershaw	South Carolina.
W. T. McGlothlin	Richland Station	Sumner	Tennessee.
G. P. Lloyd	Winfred	Jasper	Georgia.
G. S. Wright	Duncans	Spartanburgh	South Carolina.
J. M. Dill	Clay Hill	Lincoln	Georgia.
W. T. Henderson	Coronaca	Abbeville	South Carolina.
Samuel D. McGill	Camp Ridge	Williamsburgh	Do.
W. M. Dalton	Dido	Choctaw	Mississippi.
John N. Miller	Glenn Springs	Spartanburgh	South Carolina.
William A. Love	Crawford	Lowndes	Mississippi.
J. F. Smith	Cedar Grove	Walker	Georgia.
W. J. Taylor	Cloverdale	Dade	Do.
J. W. Rosamond	Brushy Creek	Anderson	South Carolina.
C. D. Williamson	Big Oak	Moore	North Carolina.
George D. Norris	New Market	Madison	Alabama.
Henry D. Bennett	Guntersville	Marshall	Do.
I. E. Goodgion	Goodgion's Factory	Laurens	South Carolina.
B. F. Grady	Albertsons	Duplin	North Carolina.
A. F. Murray	Albany	Delaware	Indiana.
I. D. Love	Oktribbeha	Oktribbeha	Mississippi.
H. Benedict	Springport	Henry	Indiana.
Frank Burns	Blountsville	Blount	Alabama.
John S. Walser	Riches	Sauk	Wisconsin.
C. L. Williams, jr.	Nacoochee	White	Georgia.
J. W. Each	Holland's Store	Anderson	South Carolina.
I. R. Littlejohn	Asbury	Union	Do.
Silas C. Turnbo	Protem	Taney	Missouri.
J. W. Sessoms	Bethlehem	Hertford	North Carolina.
I. L. Guthridge	Mingo	Champaign	Ohio.
C. G. Wilson	Milledgeville	Baldwin	Georgia.
James A. Garvin	Newton	Catawba	North Carolina.
James H. Bishop	Beaulville	Duplin	Do.
W. A. Montgomery	Cross Plains	Calhoun	Alabama.
J. W. Gore	Chapel Hill	Orange	North Carolina.
John McColn	Stratford	Greene	Missouri.
W. B. King	Black-Jack	Robertson	Tennessee.
G. J. N. Wilson	Jefferson	Jackson	Georgia.
C. A. Roberts	Campbell	Knox	Tennessee.
C. H. Egolf	Etna	Licking	Ohio.
K. T. Daniell	Cross Plains	Calhoun	Alabama.
Seaborn Kitchens	Gibson	Glascocok	Georgia.
J. M. Henderson	Stout	Union	North Carolina.
J. S. Renninger	Minnesota	Lyon	Minnesota.
Charles Ambrose, jr.	Millersport	Fairfield	Ohio.
W. C. Barkin	Coats Bend	Etowah	Alabama.
J. E. Willet	Macon	Bibb	Georgia.
Charles A. Beam	Beamville	Allegheny	Pennsylvania.
G. B. Telford	Grove Level	Banks	Georgia.
William P. Hoy	Millville	Spartanburgh	South Carolina.
William Riley	Ohio	Anderson	Do.
B. F. Grigg	Lincolnton	Lincoln	North Carolina.
A. J. McCall	Bath	Steuben	Do.
Charles Moore	Pottstown	Montgomery	Pennsylvania.
A. Sharpless	West Chester	Chester	Do.
J. N. Smith	Mount Summit	Henry	Indiana.
C. M. Hunt	Gamble's Store	Rutherford	North Carolina.
L. M. Werts	Clouds Creek	Edgefield	South Carolina.
W. H. Pratt, secretary Academy of Natural Science.	Davenport	Scott	Iowa.
F. E. Jerome	Russell	Russell	Kansas.
John Covert	Oregon	Clark	Indiana.
John R. Shaffer	Fairfield	Jefferson	Iowa.
F. E. Charlesworth	Ledyard	Outagamie	Wisconsin.
A. T. Fuller	Hogansville	Troup	Georgia.
M. W. Coulter	Columbus	Cherokee	Kansas.
T. F. Warner	Platte City	Platte	Missouri.
A. B. Braydon	Monroe	Monroe	Michigan.
Frank P. Hall	Edina	Knox	Missouri.
S. A. Day	Osawatomie	Miami	Kansas.
Geo. Ware	Washington	Wilkes	Georgia.
Miss E. Foster	Newton	Sussex	New Jersey.
Martin Clark	Sutton	Clay	Nebraska.

*List of tornado reporters, June 30, 1885—Continued.*

Name.	Post-office.	County.	State or Territory.
A. S. Currey .....	Trenton .....	Gibson .....	Tennessee.
A. M. Gibson .....	Chepultepec .....	Blount .....	Alabama.
A. D. Cadwallader .....	Lincoln .....	Logan .....	Illinois.
W. B. Jones .....	Herndon .....	Burke .....	Georgia.
D. W. Brainard .....	Grinnell .....	Poweshiek .....	Iowa.
J. W. Groesbeck .....	Harvard .....	McHenry .....	Illinois.
Alfred S. Franklin .....	Covington .....	Newton .....	Georgia.
James Seaborn .....	Fair Play .....	Oconee .....	South Carolina.
D. C. Neff .....	Day .....	Clark .....	Wisconsin.
T. B. Headford .....	Essexville .....	Bay .....	Michigan.
W. M. Owen .....	Crothersville .....	Jackson .....	Indiana.
T. J. Painter .....	Connesauga .....	Murray .....	Georgia.
W. S. Ruckel .....	De Witt .....	Carroll .....	Missouri.
I. A. Ward .....	Troy .....	Lincoln .....	Do.
W. C. Stovall .....	Rock Mart .....	Polk .....	Georgia.
L. M. Putnam .....	Swain .....	Spartanburg .....	South Carolina.
A. B. Woodruff .....	Woodruffs .....	do .....	Do.
James S. Robinson .....	Willington .....	Abbeville .....	Do.
A. P. Trautwein .....	Office of Continental Works.	Greenpoint .....	New York.
W. A. Battalle .....	Mobile .....	Mobile .....	Alabama.
J. W. Knight .....	Racine .....	Racine .....	Wisconsin.
J. R. Spencer .....	Arilla .....	Jasper .....	Missouri.
Prof. C. P. Conrad .....	Fayetteville .....	Washington .....	Arkansas.
S. E. Hocker .....	Georgetown .....	Ottawa .....	Kansas.
Dr. S. B. Bowles .....	Greenfield .....	Dade .....	Missouri.
Robert Woody .....	Crayton .....	Fannin .....	Georgia.
Dr. R. C. Kedgie .....	Agricultural College .....	Lansing .....	Michigan.
H. H. Clayton .....	Murfreesborough .....	Rutherford .....	Tennessee.
J. F. Hopkins .....	Mabelvale .....	Pulaski .....	Arkansas.
B. H. Sellmeyer .....	Knobel .....	Clay .....	Do.
J. R. Woodfill .....	Verona .....	Lawrence .....	Missouri.
J. W. Ingles .....	Pleasant Hill .....	Saline .....	Nebraska.
Dr. James Davis .....	Kellogg .....	Wabasha .....	Minnesota.
W. R. Lesser .....	Tama City .....	Tama .....	Iowa.
Samuel R. Weed .....	Wabauunsee .....	Wabauunsee .....	Kansas.
E. D. Springer .....	South Creek .....	Beaufort .....	North Carolina.
W. T. Boyse .....	Long Branch .....	Saline .....	Illinois.
H. Eastland .....	Forest .....	Scott .....	Mississippi.
Lee S. Cobb .....	Onondaga .....	Ingham .....	Michigan.
A. E. McGoffin .....	Lyons .....	Rice .....	Kansas.
B. B. Barry .....	Pollocksville .....	Jones .....	North Carolina.
A. W. Willmarth .....	Embarrase .....	Waupeca .....	Wisconsin.
E. S. Griffin .....	Rices .....	Pickens .....	South Carolina.
H. D. Olds .....	Cedar Rapids .....	Linn .....	Iowa.
Stephen Chapman .....	Bloomfield .....	Stoddard .....	Missouri.
John L. Tunnell .....	Ozark .....	Christian .....	Do.
Rev. Ira R. Hicks .....	Pinkelville, West Saint Louis .....	Saint Louis .....	Do.
C. J. Bayer .....	Cedar Rapids .....	Linn .....	Iowa.
J. M. Martin .....	Corinth .....	Alcorn .....	Mississippi.
Dr. Frank Prince .....	Jonesborough .....	Jefferson .....	Alabama.
William Dunlap .....	Wolf Creek .....	Saint Clair .....	Do.
W. C. Mathews .....	Tennille .....	Washington .....	Georgia.
G. W. Clements .....	De Armanville .....	Calhoun .....	Alabama.
S. A. Harris .....	Dawson's Cross R'ds.	Halifax .....	North Carolina.
William A. McCresless .....	Albertville .....	Marshall .....	Alabama.
Benjamin F. Dorsey .....	Jasper .....	Pickens .....	Georgia.
Benjamin P. Berry .....	Brownsville .....	Blount .....	Alabama.
R. A. Rouse .....	Scranton .....	Williamsburgh .....	South Carolina.
D. A. Montgomery .....	Pleasant Ridge .....	Green .....	Alabama.
J. H. Spote .....	Stokes Bridge .....	Darlington .....	South Carolina.
F. H. Dover .....	Whitaker .....	York .....	Do.
William W. Kinezey .....	Diamond .....	Gilmer .....	Georgia.
J. J. A. Sharp .....	Walesco .....	Cherokee .....	Do.
H. C. Moore .....	Macon .....	Bibb .....	Do.
H. T. Bernes .....	Worthville .....	Butts .....	Do.
W. K. Sharp .....	Townville .....	Anderson .....	South Carolina.
W. E. Manning .....	Spring Hope .....	Nash .....	North Carolina.
George Wilcox .....	Carbonton .....	Moore .....	Do.
G. E. Weber .....	Opelika .....	Lee .....	Alabama.
R. T. Rush .....	Harrisville .....	Montgomery .....	North Carolina.
H. D. Mason .....	William's Mills .....	Chatham .....	Do.
E. C. Smith .....	Toad Vine .....	Jefferson .....	Alabama.
Augustus S. Erwin .....	Grace .....	Lumpkin .....	Georgia.
John G. Finley .....	Bruner .....	Calhoun .....	Alabama.
W. J. Bell .....	Gaffney City .....	Spartanburgh .....	South Carolina.
J. B. Jones .....	Herndon .....	Burke .....	Georgia.
W. A. Spencer .....	Peoples .....	Laurel .....	Kentucky.
John H. Dent .....	Cave Spring .....	Floyd .....	Georgia.
S. A. Gregg, jr. ....	Mars Bluff .....	Marion .....	South Carolina.
John F. Bishop .....	Woodville .....	Jackson .....	Alabama.
George A. Vance .....	Mound Valley .....	Labette .....	Kansas.

*List of tornado reporters, June 30, 1885—Continued.*

Name.	Post-office.	County.	State or Territory.
Sylvester Flagler .....	Whitehall.....	Trempealeau.....	Wisconsin.
J. B. Britton.....	Pine Log .....	Bartow .....	Georgia.
H. G. Reed.....	Anderson .....	Anderson.....	South Carolina.
J. M. Robertson .....	Laurens .....	Laurens .....	Do.
S. E. Freeland.....	Plum Branch.....	Edgefield.....	Do.
B. H. McEckron.....	Concordia.....	Cloud.....	Kansas.
Paul Quattlebaum .....	Leesville.....	Lexington.....	South Carolina.
H. C. Russell.....	Eufaula.....	Barbour.....	Alabama.
Col. George H. Faribault.....	Archer Lodge.....	Johnston.....	North Carolina.
George E. Lodaham .....	Pacolet.....	Spartanburgh .....	South Carolina.
A. E. Sturgis .....	Thompson .....	McDuffie.....	Georgia.
W. A. McLane.....	Abbeville.....	Wilcox.....	Georgia.
B. Niblack.....	Virgil.....	Jackson.....	Do.
S. E. McMillan.....	Tabernacle.....	Marion.....	South Carolina.
L. C. Coulson.....	Scottsborough.....	Jackson.....	Alabama.
J. S. Jossey.....	Maynard.....	Monroe.....	Georgia.
J. H. Stephenson.....	Flat Rock.....	Kershaw.....	South Carolina.
G. V. Young.....	Waverly.....	Clay.....	Mississippi.
Isaac T. Wilson.....	Trenton.....	Jones.....	North Carolina.
Dr. G. G. Whitcomb.....	Ogretta.....	Cherokee.....	Do.
G. A. Tike.....	Damascus.....	Spartanburgh.....	South Carolina.
James G. Van Frank.....	Kasson.....	Dodge.....	Minnesota.
W. A. Hunter.....	Hunters.....	Abbeville.....	South Carolina.
J. P. G. Campbell.....	Trenton.....	Smith.....	Mississippi.
I. F. Caveness.....	Buffalo Ford.....	Randolph.....	North Carolina.
L. S. Fuller.....	Libon.....	Laurens.....	South Carolina.
Dr. John M. Surface.....	Lake City.....	Jackson.....	Missouri.
J. Frank Folger.....	Pickens C. H.....	Pickens.....	South Carolina.
T. A. Bereman.....	Mount Pleasant.....	Henry.....	Iowa.
J. Shuster.....	Farmersville.....	Union.....	Louisiana.
S. O. Middleton.....	Hallsville.....	Duplin.....	North Carolina.
T. J. Cowden.....	Grief.....	Bradley.....	Tennessee.
H. Edmund Ravenel.....	Keowee.....	Oconee.....	South Carolina.
John Inman.....	Somersct.....	Pulaski.....	Kentucky.
K. Robertson.....	Mountain Home.....	Baxter.....	Arkansas.
Ignatius F. Reese.....	Oneal.....	Greenville.....	South Carolina.
William Bell.....	Osage.....	Mitchell.....	Iowa.
Dr. D. W. Dunn.....	Chatauqua.....	Chatauqua.....	Kansas.
Robert L. Steele.....	Rockingham.....	Richmond.....	North Carolina.
Dr. E. T. McSwain.....	Cross Hill.....	Laurens.....	South Carolina.
B. Bowers.....	Bowersville.....	Hart.....	Georgia.
W. August Fonda.....	Carroll.....	Carroll.....	Iowa.
Jos. Cohen.....	Alfante.....	Madison.....	Indiana.
Thomas Dalton.....	Green Mount.....	Laurel.....	Kentucky.
W. F. Houseal.....	Little Mountain.....	Lexington.....	South Carolina.
Z. D. Smith.....	Zadoc.....	York.....	Do.
Amasa Cobb.....	Beloit.....	Mahoning.....	Ohio.
William Curry.....	Blue Hill.....	Webster.....	Nebraska.
A. C. McIntosh.....	Taylorsville.....	Alexander.....	North Carolina.
H. L. Seib.....	Hamburg.....	Saint Charles.....	Missouri.
John T. Camp.....	Gillsville.....	Hall.....	Georgia.
D. R. Elkin.....	Alston.....	Fairfield.....	South Carolina.
M. H. Ganong.....	Fort Atkinson.....	Jefferson.....	Wisconsin.
George W. Johnson.....	Campagne.....	Towns.....	Georgia.
Jos. Habberthier.....	Bridgeport.....	Warren.....	Missouri.
J. O. Perry.....	Troup Factory.....	Troup.....	Georgia.
N. S. Whitney.....	Edwardsville.....	Madison.....	Illinois.
Robert A. Wood.....	Woodburn.....	Macoupin.....	Do.
Hunter & Robinson.....	Belton.....	Bell.....	Texas.
W. F. Manuel.....	Mortonsville.....	Woodford.....	Kentucky.
A. Cookendarfer.....	Berlin.....	Bracken.....	Do.
Dr. A. M. Bourland.....	Van Buren.....	Crawford.....	Arkansas.
G. W. Stanton.....	Elk City.....	Montgomery.....	Kansas.
Dr. I. Humphrey.....	Fairbury.....	Jefferson.....	Nebraska.
Prof. J. H. Cook.....	Columbus.....	Cherokee.....	Kansas.
F. W. Doe.....	Claremont.....	Dodge.....	Minnesota.
Dr. J. W. Jacobs.....	Mount Hor.....	Bracken.....	Kentucky.
D. D. Parry.....	Monmouth.....	Warren.....	Illinois.
A. O. McCreery.....	Wetmore.....	Nemaha.....	Kansas.
Prof. A. Howell.....	White Plains.....	Greene.....	Georgia.
G. P. Clarke.....	Decatur.....	Newton.....	Mississippi.
W. F. Hill.....	Mountaintown.....	Gilmer.....	Georgia.
Dr. S. Laning.....	Kingman.....	Kingman.....	Kansas.
J. P. D. Murphy.....	Bear Creek.....	Randolph.....	Alabama.
Otis Ashmore.....	Harlem.....	Columbia.....	Georgia.
Dr. R. Hicks.....	Hickville.....	Rutherford.....	North Carolina.
J. B. Dickson.....	Locust Grove.....	Henry.....	Georgia.
M. D. Kirk.....	Sturgis.....	Saint Joseph.....	Michigan.
I. Ash.....	Alexander.....	Pulaski.....	Arkansas.
G. B. Cowley.....	Glasville.....	Caldwell.....	Missouri.
I. M. Peeler.....	Pine Grove.....	Union.....	South Carolina.
N. W. Kuhn.....	Appleton.....	Pope.....	Arkansas.
Henry Little.....	Kalamazoo.....	Kalamazoo.....	Michigan.

*List of tornado reporters, June 30, 1885—Continued.*

Name.	Post-office.	County.	State or Territory.
T. A. McAllister.....	Calhoun's Mills.....	Abbeville.....	South Carolina.
P. J. N. Wilson.....	Jefferson.....	Jackson.....	Georgia.
W. D. Humphrey.....	Ianey.....	Choctaw.....	Alabama.
B. A. Strange.....	Ellaville.....	Schley.....	Georgia.
J. W. Edwards.....	Woodstock.....	Cherokee.....	Do.
N. W. Bonton, M. D.....	Ashland.....	Benton.....	Mississippi.
W. C. Bookin.....	Coat's Bend.....	Etowah.....	Alabama.
L. Shaucke.....	Dell.....	Faribault.....	Minnesota.
Albert G. Williams.....	Blue Spring.....	Jackson.....	Missouri.
B. F. O'Kelly.....	Planter.....	Madison.....	Georgia.
M. P. White.....	Whiton.....	De Kalb.....	Alabama.
A. P. Sims.....	Morton.....	Scott.....	Mississippi.
Wesley Ohl.....	West Austintown.....	Mahoning.....	Ohio.
J. K. Allen.....	Alliance.....	Stark.....	Do.
W. F. Rice.....	Draper.....	Jasper.....	Iowa.
Benjamin Morgan.....	Richland.....	Keokuk.....	Do.
Charles L. Davis.....	Warm Springs.....	Meriwether.....	Georgia.
N. E. Goldthwait.....	Boone.....	Boone.....	Iowa.
Charles Lonsdale.....	Dale City.....	Guthrie.....	Do.
S. Cary.....	Saratoga.....	Winona.....	Minnesota.
S. H. Roult.....	Rural Vale.....	Whitfield.....	Georgia.
James E. McNair.....	Webb City.....	Jasper.....	Missouri.
Benjamin Hunt.....	Eatonton.....	Putnam.....	Georgia.
S. S. Lindler.....	Pine Ridge.....	Lexington.....	South Carolina.
Link Sanders.....	Honey Creek.....	Henry.....	Indiana.
Dr. H. C. Mathis.....	Taylorville.....	Spencer.....	Kentucky.
J. W. Livingston.....	Seneca.....	Oconee.....	South Carolina.
Rev. C. Foster Williams.....	Hoffman.....	Mauzy.....	Tennessee.
Preston J. Clarke.....	Rockpile.....	Dawson.....	Georgia.
C. H. Andrew.....	Fort Lamar.....	Madison.....	Do.
J. P. Bain.....	Texas City.....	Saline.....	Illinois.
J. L. Wilson.....	Bairdstown.....	Oglethorpe.....	Georgia.
Mrs. M. B. McConnell.....	Black Mingo.....	Williamsburg.....	South Carolina.
Dr. P. H. Mayo.....	Falkland.....	Pitt.....	North Carolina.
F. B. Sawvel.....	Canfield.....	Mahoning.....	Ohio.
T. B. Nees.....	Hartford.....	Lyon.....	Kansas.
H. A. Blakely.....	Auburn.....	Gwinnett.....	Georgia.
D. R. Feaster.....	Feasterville.....	Fairfield.....	South Carolina.
J. A. Walther.....	Winton.....	Hertford.....	North Carolina.
A. B. Grover.....	Mitchell.....	Robertson.....	Tennessee.
Joseph M. Graham.....	Skye.....	Richmond.....	North Carolina.
Elias Casper.....	Cobb.....	Shelby.....	Alabama.
John W. Jones.....	Coral Hill.....	Barren.....	Kentucky.
G. W. P. Carr.....	Tazewell.....	Marion.....	Georgia.
Albert P. Leisser.....	Browns.....	Dallas.....	Alabama.
W. H. D. Brown.....	Reid.....	Greenville.....	South Carolina.
John Reynolds.....	Mayfield.....	Hancock.....	Georgia.
Thomas R. Davis.....	Price's Mill.....	Union.....	North Carolina.
Richard C. Young.....	Winchester.....	Jefferson.....	Kansas.
Lewis Lowe.....	Pleasant Mound.....	Montgomery.....	Tennessee.
S. W. Terrell.....	Polesville.....	Wake.....	North Carolina.
W. C. McBrayer.....	Draketown.....	Haralson.....	Georgia.
Hon. W. H. McClure.....	Hayesville.....	Clay.....	North Carolina.
Dr. J. M. Lyle.....	Franklin.....	Macon.....	Do.
N. G. Phillips.....	Robbinsville.....	Graham.....	Do.
D. A. Collins.....	Charleston.....	Swayne.....	Do.
Hon. James W. Terrill.....	Webster.....	Jackson.....	Do.
Hon. M. C. King.....	Murphy.....	Cherokee.....	Do.
Capt. C. H. Messenger.....	Asheville.....	Buncombe.....	Do.
Prof. J. A. Davis.....	Wataulula.....	Franklin.....	Arkansas.
T. H. Rankin.....	Berry.....	Harrison.....	Kentucky.
J. W. Gifford.....	Dansville.....	Ingham.....	Michigan.
J. F. Smith.....	Cedar Grove.....	Walker.....	Georgia.
Matt. T. Baptiste.....	West Point.....	Clay.....	Mississippi.
T. W. Florer.....	Waxahachie.....	Ellis.....	Texas.
Arthur Dransfield.....	New Harmony.....	Posey.....	Indiana.
John F. Cotton.....	Flagtown.....	Montgomery.....	North Carolina.
J. M. Anderson.....	Cowan.....	Delaware.....	Indiana.
A. H. Harlan.....	New Burlington.....	Clinton.....	Ohio.
Dr. A. C. Halbert.....	Cobb Switch.....	Lowndes.....	Mississippi.
A. H. Peffy.....	Arcanum.....	Darke.....	Ohio.
Dr. R. M. Cotton.....	Tyndall.....	Bon Homme.....	Dakota.
George B. Bard.....	Symco.....	Waupaca.....	Wisconsin.
Frank Pease.....	Silver City.....	Montgomery.....	Arkansas.
P. C. Bluhm.....	Smithville.....	De Kalb.....	Tennessee.
C. C. Gossett.....	Cain's Store.....	Pulaski.....	Kentucky.
A. B. Etienne.....	Centreville.....	Saint Mary's.....	Louisiana.
J. B. Herndon.....	Keysburgh.....	Logan.....	Kentucky.
Allen White.....	Houston.....	Chickasaw.....	Mississippi.
D. B. White.....	Snow Creek.....	Iredell.....	North Carolina.
J. H. Roark.....	Marion.....	Union.....	Louisiana.
M. M. Moulton.....	Webster.....	do.....	Dakota.
A. W. Hawkins.....	Huntingdon.....	Carroll.....	Tennessee.

*List of tornado reporters, June 30, 1885—Continued.*

Name.	Post-office.	County.	State or Territory.
John G. Edwards	Edward	Franklin	Ohio.
John Merkle	Reno	Houston	Minnesota.
John Blume	Marathon	Marathon	Wisconsin.
Hon. A. B. Greenwood	Bentonville	Benton	Arkansas.
J. R. Plyler	Plyler's	Laconster	South Carolina.
G. G. Hughes	Burlington	Boone	Kentucky.
Eli Stewart	Stewart's Mill	Schley	Georgia.
J. S. Durham	Double Shoal	Cleveland	North Carolina.
W. R. Capehart	Avoca	Bertie	Do.
W. H. Cook	Saddlersville	Robertson	Tennessee.
Miss Jane P. Jones	Jones Creek	Anson	North Carolina.
Dr. L. J. Thomas	York	Houston	Georgia.
D. Bienvonn, jr.	Labadieville	Assumption	Louisiana.
Robt. J. Jewell	Elk Creek	Spencer	Kentucky.
John F. Webster	Rutland	Harrison	Do.
L. A. Lavender	Mantua	Greene	Alabama.
Newel Thurston	Hope	Dickinson	Kansas.
V. M. Howard	Deerfield	Franklin	Massachusetts.
Sarah E. W. Winslow	Science Hill	Randolph	North Carolina.
Geo. H. Dunn	Greensburgh	Decatur	Indiana.
Dr. W. F. Brooker	Pine Plains	Lexington	South Carolina.
Ben. R. Berry	Brooksville	Blount	Alabama.
Levi T. Branson	White House	Randolph	North Carolina.
E. B. Proctor	Lumberton	Robeson	Do.
J. L. Coleman	Lineburgh	Pickens	Alabama.
W. C. McMurray	Farmer City	De Witt	Illinois.
John F. Holden	Crawfordville	Tallapoosa	Georgia.
Mont Robinson	Fairmont	Vermillion	Louisiana.
Mrs. Isaac Seasums	Seasumsville	Oktibbeha	Mississippi.
Thomas G. Scott	Forsyth	Monroe	Georgia.
James L. Newhouse	Reed's Station	Delaware	Indiana.
H. B. Blakely	Scuffletown	Laurens	South Carolina.
Judge B. P. Harran	Arlington	Reno	Kansas.
W. J. Rice	Liberty	Pickens	South Carolina.
Calvin Hardison	Hardison's Mills	Mauzy	Tennessee.
J. K. Neal	Neal	Pickett	Do.
George L. Hays	Marshall	Saline	Missouri.
M. C. Wilcox	Mount Airy	Habersham	Georgia.
A. W. Stokes	Newnan	Coweta	Do.
Jas. B. Hunnicutt	Turin	Coweta	Do.
W. A. Austin	Gibraltar	Union	North Carolina.
J. Hunsucker	Conover	Catawba	Do.
William Miller	Union	Green	Alabama.
R. L. McNabb	Ooltewah	James	Tennessee.
W. A. Morton	Abilene	Dickinson	Kansas.
D. A. Speer	Varnell's Station	Whitfield	Georgia.
John M. Smith	Skelton	Jefferson	Alabama.
Henry C. Long	Waverly	Clay	Mississippi.
Ira C. Dickerson	Lawley	Shelby	Alabama.
W. P. Bradford	Danburgh	Wilkes	Georgia.
W. P. Stearns	Stearnsville	Pike	Do.
Josiah Buscton	Shaker	Warren	Ohio.
W. B. Johnson	Moore's Creek	Jackson	Kentucky.
J. M. Scott	Montpelier	Clay	Mississippi.
O. B. Jenks	North Brook	Lincoln	North Carolina.
N. L. Willet	Augusta	Richmond	Georgia.
F. D. Parmelee	Hillsdale	Hillsdale	Michigan.
Daniel Faulkner	Poston	Ripley	Indiana.
J. C. Hunter	Goshen Hill	Union	South Carolina.
Dr. V. S. McNider	Jackson	Northampton	North Carolina.
J. M. Myers	Belton	Hall	Georgia.
J. H. Tabor	Bankston	Choctaw	Mississippi.
George W. Turner	Lillington	Harnett	North Carolina.
B. L. Blackmore	Warsaw	Duplin	Do.
Dr. E. C. Cochran	Tunnel Hill	Whitfield	Georgia.
J. R. Widby	Lenoir	Caldwell	North Carolina.
James A. Evans	Scottville	Maconupin	Illinois.
Rev. William E. Kimball	Madison	Madison	Nebraska.
J. P. Atkins	Pittsburg Landing	Hardin	Tennessee.
John R. Gill	Wilson	Winona	Tennessee.
Dr. James P. Owen	Point Peter	Searcy	Arkansas.
H. F. Shaner	Troy	Doniphan	Kansas.
E. B. Sankey	Salem	Dent	Missouri.
J. G. Orton	Binghamton	Broome	New York.
D. W. Brailsford	Panola	Clarendon	North Carolina.
Mary C. Jameson	Geneva	Talbot	Georgia.
W. H. Dunkin	Hutchinson	Reno	Kansas.
W. F. White	Ford's Store	Hart	Georgia.
C. E. Webster	Almond	Portage	Wisconsin.
T. C. Osborn	Cleburne	Johnson	Texas.
Stephen Crosby	Meador	Union	South Carolina.
Daniel Stone	Cincinnati		Ohio.
William H. Hancock	Abbeville	Abbeville	South Carolina.

*List of tornado reporters, June 30, 1885—Continued.*

Name.	Post-office.	County.	State or Territory.
H. D. Pearce.....	Runnels.....	Runnels.....	Texas.
W. J. Davisson.....	Farmland.....	Randolph.....	Indiana.
A. Hoffman.....	Hartley.....	Montgomery.....	Texas.
H. F. Stringfellow.....	Deep Spring.....	Cheatham.....	Tennessee.
J. H. Wood.....	Cedar Plains.....	Morgan.....	Alabama.
L. D. Walrad.....	Mount Ida.....	Anderson.....	Kansas.
C. Bouseman.....	Saratoga.....	Randolph.....	Indiana.
Helen F. Halloway.....	Winslow.....	Harnett.....	North Carolina.
Thomas Marrow.....	Hartsell.....	Morgan.....	Alabama.
H. J. Raysdale.....	Urena.....	Banks.....	Georgia.
R. S. McMahon.....	Chachoula.....	Terre Bonne.....	Louisiana.
J. H. Williams.....	Fordland.....	Webster.....	Missouri.
R. B. Olmstead.....	Milan.....	Rock Island.....	Illinois.
Charles P. Hillan.....	Centreville.....	Montgomery.....	Ohio.
David Evans.....	Macedonia.....	Franklin.....	Indiana.
C. R. Baugh.....	Mershan's Cross R'ds	Laurel.....	Kentucky.
John McCullough.....	Hillsborough.....	Jasper.....	Georgia.
M. E. Stewart.....	Clanton.....	Chilton.....	Alabama.
H. Keneghan.....	Brandon.....	Rankin.....	Mississippi.
J. C. Hutchison.....	Monmouth.....	Warren.....	Illinois.
Sallie Dillon.....	Little Rock.....	Marion.....	South Carolina.
T. J. Maxwell.....	Saint John.....	Stafford.....	Kansas.
H. J. Yarbrough.....	Guernsey.....	Hempstead.....	Arkansas.
S. N. Russell.....	Blairsville.....	York.....	South Carolina.
G. H. Slaughter.....	Saint Bethlehem.....	Montgomery.....	Tennessee.
G. W. Templeton.....	Mooreville.....	Iredell.....	North Carolina.
J. H. Gouger.....	Davidson College.....	Mecklenburgh.....	Do.
William M. Towers.....	Rome.....	Floyd.....	Georgia.
L. M. Wainwright.....	Noblesville.....	Hamilton.....	Indiana.
I. N. Beckner.....	Whitesburgh.....	Hambleton.....	Tennessee.
R. S. Allen.....	Tyra.....	Moore.....	North Carolina.
W. C. Rollins.....	Rome.....	Williamsburgh.....	South Carolina.
Hosea Hale.....	Love's Level.....	Union.....	North Carolina.
George Allen.....	Poland.....	Mahoning.....	Ohio.
Iva A. Fitzgerald.....	Linwood.....	Davidson.....	North Carolina.
William A. Black.....	Americus.....	Sumpter.....	Georgia.
N. L. Willet.....	Augusta.....	Richmond.....	Do.
A. E. Sprague.....	Briece.....	Franklin.....	Ohio.
M. L. Lamaster.....	Pinkney.....	Union.....	South Carolina.
William Wine.....	Rockford.....	Blount.....	Tennessee.
S. B. Garrett.....	Daleville.....	Delaware.....	Indiana.
W. A. Austin.....	Gibraltar.....	Union.....	North Carolina.
Dr. P. D. Robertson.....	Lima.....	Carroll.....	Missouri.
W. L. Belk.....	Big Springs.....	Clay.....	Mississippi.
W. J. Dennis.....	Indiantown.....	Williamsburgh.....	South Carolina.
J. A. Hartzler.....	Mottville.....	Saint Joseph.....	Michigan.
R. Rusner.....	Wellford.....	Spartanburgh.....	South Carolina.
J. B. Alexander.....	Duck Creek.....	Dallas.....	Texas.
John L. Bardin.....	Effingham Station.....	Marian.....	South Carolina.
Dr. A. R. Kilpatrick.....	Navasota.....	Grimes.....	Texas.
Peter Huling.....	Parker.....	Montgomery.....	Kansas.
W. L. Gilbert.....	Elmwood.....	Iredell.....	North Carolina.
J. B. Anderson.....	Waterloo.....	Laurens.....	South Carolina.
Ed. Zumbro.....	Browning.....	Linn.....	Missouri.
A. W. Wilcox.....	Le Mars.....	Plymouth.....	Iowa.
William H. Bonner.....	Calhoun.....	Gordon.....	Georgia.
J. W. Clopton.....	Lamar.....	Sumter.....	Do.
J. T. Thompson.....	Lilly Pond.....	Gordon.....	Do.
E. J. Simmons.....	Courtland.....	Lawrence.....	Alabama.
G. F. Arnick.....	Scipio.....	Jennings.....	Indiana.
James M. Johnson.....	Hoover Hill.....	Randolph.....	North Carolina.
C. C. White.....	High Point.....	Guilford.....	Do.
John G. Kay.....	Ithaca.....	Darke.....	Ohio.
F. A. O. Angle.....	Dandridge.....	Jefferson.....	Tennessee.
John Christine.....	Waymansville.....	Bartholomew.....	Indiana.
Prof. J. Allen Holt.....	Oak Ridge.....	Guilford.....	North Carolina.
S. F. Hardy.....	Markleville.....	Madison.....	Indiana.
Samuel Pruitt.....	Polk Bayou.....	Sharp.....	Arkansas.
D. H. Bagley.....	Beulah.....	Johnston.....	North Carolina.
H. P. Daviss.....	Fairfield.....	Freestone.....	Texas.
H. C. Hogg.....	Booneville.....	Owsly.....	Kentucky.
J. N. Mangum.....	Pine Tree.....	Chesterfield.....	South Carolina.
J. W. Renfro.....	Howth Station.....	Waller.....	Texas.
P. Bryan, Jr.....	Leedsdale.....	Morgan.....	Alabama.
J. M. Hough.....	Old Store.....	Chesterfield.....	South Carolina.
Henry Baxter.....	Galen.....	Warren.....	Pennsylvania.
N. J. Proctor.....	O'Kean.....	Randolph.....	Arkansas.
G. W. Brooks.....	Ellsworth.....	Mahoning.....	Ohio.
T. Collins.....	Choestoe.....	Union.....	Georgia.
Thomas L. Reid.....	Robertson.....	Clay.....	Mississippi.
J. S. Britt.....	Wideman's.....	Abbeville.....	South Carolina.
Dr. George C. McNeill.....	Catawba.....	Catawba.....	North Carolina.
Warren F. Woodliff.....	Brown's Bridge.....	Forsyth.....	Georgia.

*List of tornados reported, June 30, 1885—Continued.*

Name.	Post-office.	County.	State or Territory.
David Burris.....	Big Lick.....	Stanley.....	North Carolina.
G. R. Phillips.....	Chickamauga.....	Hamilton.....	Tennessee.
L. A. Elster.....	Jeffersonville.....	Fayette.....	Ohio
T. C. Sexton.....	Burnt Factory.....	Spartanburg.....	South Carolina.
W. L. Springfield.....	Belville.....	Austin.....	Texas.
C. I. Holland.....	Holland's Store.....	Chatoga.....	Georgia.
J. A. D. Stephenson.....	Statesville.....	Iredell.....	North Carolina.
Samuel Buchanan.....	Welda.....	Anderson.....	Kansas.
John G. Detwiler.....	New Smyrna.....	Volusia.....	Florida.
W. O. Kidder.....	Youngstown.....	Warren.....	Illinois.
W. C. Dunn.....	Simpson's Mills.....	Laurens.....	South Carolina.
V. M. Lahman.....	Wiota.....	Cass.....	Iowa.
W. M. Stringer.....	Stringer.....	Morgan.....	Alabama.
O. G. Campbell.....	Greenville.....	Washington.....	Texas.
M. B. Clark.....	Haskell.....	Anderson.....	Kansas.
John T. M. Haire.....	Lexington.....	Oglethorpe.....	Georgia.
M. D. Watson.....	Line Creek.....	Webster.....	Mississippi.
H. J. Slatnes.....	Mount Prospect.....	Union.....	North Carolina.
J. W. Hackworth.....	Brenham.....	Washington.....	Texas.
William L. Jones.....	Atlanta.....	Fulton.....	Georgia.
E. R. Steele.....	Neodesha.....	Wilson.....	Kansas.
Morgan Blair.....	Cedar Valley.....	Caldwell.....	North Carolina.
John D. Johnson.....	State Road.....	Surry.....	Do.
C. H. Longstreth.....	Lakin.....	Finney.....	Kansas.
W. R. Hambrick.....	Leasburg.....	Caswell.....	North Carolina.
T. W. Smith.....	O'Neal's Mills.....	Troup.....	Georgia.
George F. Houser.....	Ellinwood.....	Barton.....	Kansas.
G. A. Kelley, M. D.....	Burns.....	Marion.....	Do.
W. H. Knight.....	Kimeo.....	Washington.....	Do.
E. W. Russey.....	Bowie.....	Montague.....	Texas.
Eugene Honerton.....	Solomon City.....	Dickinson.....	Kansas.
J. F. Boyd.....	Personville.....	Limestone.....	Texas.
J. J. Jones.....	Milton.....	Caswell.....	North Carolina.
W. W. McCracken.....	Beloit.....	Mitchell.....	Kansas.
N. B. Snapp.....	Winslow.....	De Kalb.....	Missouri.
Mrs. J. N. Holland.....	Anderson.....	Webster.....	Mississippi.
W. W. Abercrombie.....	Saltville.....	Mitchell.....	Kansas.
Samuel Huffman.....	Matanzas.....	Chautauqua.....	Do.
J. A. Corpening.....	Mill River.....	Henderson.....	North Carolina.
L. E. Vermillion.....	Prosper.....	Rice.....	Kansas.
J. T. Steward.....	Steward's Mill.....	Freestone.....	Texas.
W. N. Hall.....	Smith Centre.....	Smith.....	Kansas.
R. B. Johnson.....	Chapel Hill.....	Washington.....	Texas.
W. H. Wilcox.....	Wilcox.....	Trego.....	Kansas.
W. P. Davis.....	Sunny Side.....	Waller.....	Texas.
Thomas Bradford.....	Centre.....	Cherokee.....	Alabama.
J. E. Thompson.....	Mount Hersey.....	Newton.....	Arkansas.
Charles A. Wyman.....	Hutchinson.....	McLeod.....	Minnesota.
E. E. Middleton.....	Woolstock.....	Wright.....	Iowa.
J. A. Fawkes.....	Delphi.....	Alleghany.....	North Carolina.
W. E. Logan.....	Grantville.....	Buncombe.....	Do.
Mrs. E. J. Bennett.....	Cashiers.....	Jackson.....	Do.
C. J. Trafton.....	Haymond.....	Presidio.....	Texas.
J. C. G. Smith.....	Fredonia.....	Wilson.....	Kansas.
J. W. Seaman.....	Loveland.....	Larimer.....	Colorado.
W. B. Pearson.....	Gere.....	Barton.....	Kansas.
George Wright.....	Dighton.....	Lane.....	Do.
Nathan Potter.....	Paris.....	Lincoln.....	Do.
Ell Newsum.....	Spring Valley.....	Mitchell.....	Texas.
A. L. Hannaford.....	Lehigh.....	Marion.....	Kansas.
Julia Emmons.....	Cutts.....	Lane.....	Do.
J. E. Shaw.....	Mulvane.....	Sumner.....	Do.
Frank B. Hancock.....	Casky.....	Christian.....	Kentucky.
Ed Atkin.....	Fremont.....	Graham.....	Kansas.
O. W. Crampton.....	Osborne.....	Osborne.....	Do.
F. W. Hopkins.....	Greenbrier.....	Limestone.....	Alabama.
C. W. McReynolds.....	Nepesta.....	Pueblo.....	Colorado.
R. R. Wilkinson.....	Weeton.....	Dunn.....	Wisconsin.
Henry Horn.....	Marshall.....	Searcy.....	Arkansas.
J. J. Larrise.....	Mecklenburgh.....	Schuyler.....	New York.
J. K. Wise.....	Blairstown.....	Benton.....	Iowa.
J. A. Keeler.....	Eagle Rapids.....	Smith.....	Kansas.
Richard Owen.....	New Harmony.....	Posey.....	Indiana.
E. L. Dunham.....	Greeley.....	Weid.....	Colorado.
Fred W. Wayner.....	Germantown.....	Smith.....	Kansas.
J. M. Fowler.....	Cashville.....	Spartanburg.....	South Carolina.
George W. Smith.....	Bennet.....	Arrapahoe.....	Colorado.
Thomas Davies.....	Abilene.....	Taylor.....	Texas.
J. P. Marshall.....	Black Hawk.....	Carroll.....	Mississippi.
Gustav Bastian.....	Welcome.....	Austin.....	Texas.
A. M. Mulford.....	New Providence.....	Hardin.....	Iowa.
P. M. Ford.....	Cross Plains.....	Robertson.....	Tennessee.
L. M. Bragg.....	Courtney.....	Grimes.....	Texas.



*List of tornado reporters, June 30, 1885—Continued.*

Name.	Post-office.	County.	State or Territory.
William R. Allen	Jackson	Pueblo	Colorado.
Frank Bascom	Upland	Jewell	Kansas.
A. H. Morris	Rush Centre	Rush	Do.
E. N. Gilbert	Steele City	Jefferson	Nebraska.
C. D. Wheelock	Allison	Decatur	Kansas.
W. G. Sidwell	Hutton	Rush	Do.
D. B. Painter	Hutton	Rhea	Tennessee.
J. G. Henslee	McEwen	Humphreys	Do.
Pinckney Hawkins	Anderson	Grimes	Texas.
George W. DeLong	Saxon	Saline	Nebraska.
John Stibal	Richland	Colfax	Do.
J. W. Kyle	Collyer	Trego	Kansas.
W. S. Dilworth	Crab Orchard	Johnson	Nebraska.
Ed. F. Brown	La Crosse	Rush	Kansas.
J. S. Bowlby	Cañon City	Fremont	Colorado
L. F. Davis	Athens	Jewell	Kansas.
E. B. Gatchell	Leona	Doniphan	Do.
William H. Snyder	Tapley	Osborne	Do.
C. P. Blachly	Manhattan	Riley	Do.
A. L. Sparger	Mount Airy	Surry	North Carolina.
W. J. Mossholder	Oceola	Polk	Nebraska.
Isaac N. Chinoweth	Eighty Eight	Barren	Kentucky.
E. Whitcomb	Friend	Saline	Nebraska.
Sarah Stuart	Wolf Creek	Cherokee	North Carolina.
Q. C. Sasser	Falsin	Duplin	Do.
Joel Hull	Windon	Kearney	Nebraska.
A. G. Eberhart	Andalusia	Rock Island	Illinois.
Joshua Taylor	White Cloud	Doniphan	Kansas.
R. B. Knock	Havana	Montgomery	Do.
W. H. Timberlake	Columbus	Cherokee	Do.
John G. Holston	Soldier	Jackson	Do.
Almon Stuart	Zyba	Kearney	Nebraska.
George Shedd	Ashland	Sauders	Do.
W. E. W. Bailey	Lapland	Greenwood	Kansas.
John L. Mitch	Catlin	Bent	Colorado.
S. G. Graham	Catlin	Do.	Do.
Isham Cox	Liberty	Randolph	North Carolina.
Agnes Kinnear	Standardt	Iowa	Wisconsin.
E. R. Ewell	Bird Nest	Pawnee	Kansas.
E. N. Eubanks	Hawthorne	Aiken	South Carolina.
G. W. Norman	Apishapa	Los Animas	Colorado.
V. S. Rannels	Runelsburg	Hall	Nebraska.
A. Knievel	Clearwater	Antelope	Do.
John James	James Crossing	Jackson	Kansas.
V. Van Trump	Belleville	Republic	Do.
E. B. McNitt	Red Cloud	Webster	Nebraska.
R. Phillips	La Junta	Bent	Colorado.
Ira N. Lyman	Saint Peter	Cedar	Nebraska.
Charles Ruff	Hodgeman	Hodgeman	Kansas.
J. H. Milhouse	Jewell	Dawson	Nebraska.
C. Fountain	Millbrook	Graham	Kansas.
W. D. Cox	Ulysses	Butler	Nebraska.
Edward Trow	Minneapolis	Ottawa	Kansas.
E. J. Brethowder	Holland	Lancaster	Nebraska.
Ed. Gilford	Cowles	Webster	Do.
E. A. Sayre	Himrod's	Yates	New York.
Samuel E. Hardy	East Norway	Doniphan	Kansas.
C. P. Woodworth	Lodi	Seneca	New York.
C. H. Heald	Mill Creek	Chichasaw Nation	Indian Territory.
John C. Mallory	Savona	Steuben	New York.
A. V. Butterfield	Eleven Mile	Potter	Pennsylvania.
E. R. Rogers	Corning	Steuben	New York.
J. M. McClain	Catlin	Bent	Colorado.
John Shoff	Grafton	Fillmore	Nebraska.
E. D. Burgess	Breesport	Chemung	New York.
B. F. Reagan	Raymond	Lancaster	Nebraska.
A. D. Swallow	Sterling	Johnson	Do.
William T. Lewis	Louisville	Winston	Mississippi.
Eddie Lewis	Worthing	Lincoln	Dakota.
T. N. Hartzell	Kearney	Buffalo	Nebraska.
Isaac E. Heaton	Fremont	Dodge	Do.
Solomon Cain	Wilcox	Nodaway	Missouri.
A. M. Pierce	Byrdstown	Pickett	Tennessee.
Harrison Russell	Big Creek	Steuben	New York.
C. H. Sharpe	Friendship	Alleghany	Do.
W. T. Chapman	Ponca	Dixon	Nebraska.
E. F. Hutchinson	Bellwood	Butler	Do.
Thomas A. Sawyer	Campbell	Steuben	New York.
Samuel D. I. Emerson	Milford	Seward	Nebraska.
G. W. Swick	Rocky Ford	Bent	Colorado.
G. H. Ransom	Bancroft	Cuming	Nebraska.
R. McHutcheon	White Rock	Republic	Kansas.
C. F. Purdy	Purdyville	Hodgeman	Do.

*List of tornado reporters, June 30, 1885—Continued.*

Name.	Post-office.	County.	State or Territory.
N. B. S. Odell.....	Fullerton.....	Nance.....	Nebraska.
A. C. Folsom.....	Dell Rapids.....	Minnehaha.....	Dakota.
C. D. Harris.....	Ovid.....	Seneca.....	New York.
Almedia L. Young.....	Branchport.....	Yates.....	Do.
S. A. Hebrew.....	Rockport.....	Rooks.....	Kansas.
J. Edward Wiley.....	Waverly.....	Morgan.....	Indiana.
G. S. Bishop.....	Indianola.....	Redwillow.....	Nebraska.
Peter Salspaur.....	Swaburg.....	Dodge.....	Do.
Charles Shieldstream.....	Central City.....	Merrick.....	Do.
P. F. Peterson.....	Tekamah.....	Burt.....	Do.
Sarah D. Anderman.....	Creston.....	Platte.....	Do.
Clyde C. Way.....	Kendall Creek.....	McKean.....	Pennsylvania.
J. Farwell.....	Phillips Creek.....	Alleghany.....	New York.
Etta Francis.....	Runnymede.....	Harper.....	Kansas.
A. Scheuber.....	Erfurt.....	Jefferson.....	Wisconsin.
P. S. Howell.....	Brett.....	Norton.....	Kansas.
D. L. Tallmadge.....	Cambridge.....	Furnas.....	Nebraska.
P. A. Bryant.....	Sonora.....	Steuben.....	New York.
S. Bredelman.....	Doniphan.....	Hall.....	Nebraska.
J. B. Nugent.....	Sherwood.....	Calumet.....	Do.
A. Morell.....	Oakland.....	Burt.....	Do.
E. P. Barber.....	Syracuse.....	Hamilton.....	Kansas.
Abner C. Wright.....	Wellburg.....	Chemung.....	New York.
W. J. Crane.....	Arlington.....	Washington.....	Nebraska.
George D. Carrington.....	Brownville.....	Nemaha.....	Do.
A. J. Barnes.....	Millport.....	Potter.....	Pennsylvania.
R. D. Winn.....	Lawrenceville.....	Gwinnet.....	Georgia.
H. Mower, M. D.....	Saint Marys.....	Pottawottamie.....	Kansas.
C. F. Carr.....	Clarence.....	Barton.....	Do.
N. T. Moulton.....	Cedar Rapids.....	Boone.....	Nebraska.
George C. Silsbee.....	Avoca.....	Steuben.....	New York.
Lott Reynor.....	Arkport.....	do.....	Do.
J. B. Lewis.....	Thornton.....	Polk.....	Nebraska.
James E. Blair.....	Elkpoint.....	Union.....	Dakota.
E. Bartholomew.....	Rockport.....	Rooks.....	Kansas.
Thomas D. McCague.....	Garnet.....	Anderson.....	Do.
C. H. Goddard.....	Swan Lake.....	Turner.....	Dakota.
L. Case.....	Knoxville.....	Tloga.....	Pennsylvania.
D. E. James.....	Richland Centre.....	Richland.....	Wisconsin.
Michael Griffin.....	Springfield.....	Bon Homme.....	Dakota.
M. A. Butterfield.....	Montrose.....	McCook.....	Do.
J. W. McReynolds.....	Tower Spring.....	Lincoln.....	Kansas.
Andrew Johnson, jr.....	Bega.....	Stanton.....	Nebraska.
D. R. Callahan.....	Stockville.....	Frontier.....	Do.
W. H. Hubbard.....	Fairview.....	Lincoln.....	Dakota.
E. Biabee.....	West Branch.....	Potter.....	Pennsylvania.
E. G. Bruner.....	West Point.....	Cumling.....	Nebraska.
John L. Hunt.....	Villanov.....	Walker.....	Georgia.
C. Q. De France.....	Kesterson.....	Jefferson.....	Nebraska.
James B. Wright.....	Zenith.....	Reno.....	Kansas.
Thomas G. Hull.....	Brookland.....	Potter.....	Pennsylvania.
Max Monvoison.....	Max.....	Dundy.....	Nebraska.
C. P. Wetzell.....	Stockville.....	Frontier.....	Do.
Nathan Campbell.....	Kearney.....	Buffalo.....	Do.
C. J. Fox.....	La Grange.....	Yankton.....	Dakota.
E. Miller.....	Lawrence.....	Douglas.....	Kansas.
Artemus Walters.....	Ula.....	Custer.....	Colorado.
M. Ryan.....	Jefferson.....	Union.....	Dakota.
Peter Ring.....	Big Spring.....	do.....	Do.
Benj. C. Rish.....	Ellis.....	Ellis.....	Kansas.
A. C. Tyrrell.....	Madison.....	Madison.....	Nebraska.
E. D. Parsons.....	Indian Creek.....	York.....	Do.
F. D. Hulbert, M. D.....	Loganville.....	Sauk.....	Wisconsin.
I. B. Wiley.....	Wileysville.....	Steuben.....	New York.
A. G. Garrett.....	Ward.....	Overton.....	Tennessee.
R. S. Gaylord.....	Riverside.....	Clay.....	Dakota.
Mrs. M. E. Ellis.....	Gothland.....	Union.....	Do.
Thomas Maher.....	Emmett.....	do.....	Do.
Will M. Cravin.....	Armada.....	Buffalo.....	Nebraska.
Erastus Smith.....	Beaver Creek.....	do.....	Do.
Frank S. Gay.....	Red Wing.....	Nance.....	Do.
T. O. Tucker.....	Saint Francis.....	Clay.....	Arkansas.
C. W. Gray.....	Jordan Springs.....	Reno.....	Kansas.
Elizabeth Ingalls.....	Long Creek.....	Lincoln.....	Dakota.
W. G. Daugherty.....	Eagle.....	Cass.....	Nebraska.
William A. Eddy.....	133 E. Sixteenth street New York City.	New York.....	New York.
G. B. Nichols.....	Martin.....	Alleghan.....	Michigan.
G. W. Moore.....	Cloverland.....	Clay.....	Indiana.
Frank Fuller.....	Wayne.....	Wayne.....	Nebraska.
Josiah Cusick.....	Nelson.....	Vigo.....	Indiana.
John W. McGinnis.....	Ashborough.....	Clay.....	Do.
M. M. Jones.....	Flandreau.....	Moody.....	Dakota.

*List of tornado reporters, June 30, 1885—Continued.*

Name.	Post-office.	County.	State or Territory.
O. R. Gaskill	White Oak	Mahaska	Iowa.
Miss Ara C. G. Williams	Rescue	Sanders	Nebraska.
W. W. Craddock	Knoxville	Marion	Iowa.
L. S. Rouse	Belle Plain	Shawano	Wisconsin.
E. Roberts	Hall's Summit	Coffey	Kansas.
H. L. Williams	Lineburg	Pickens	Alabama.
J. E. Shultz	Arberville	York	Nebraska.
I. F. Cox	La Grange	Troup	Georgia.
J. E. W. Haile	Flat Rock	Kershaw	South Carolina.
Thos Owen	Owenville	Sampson	North Carolina.
Jane Harris	do	do	Do.
Marx F. Wistrom	Harvard	Clay	Nebraska.
George A. Teel	Seaton	Hamilton	Do.
G. M. Dodge	Glencoe	Dodge	Do.
Albert Armes	Kendall	Van Buren	Michigan.
Timothy Church	Cheshire	Allegan	Do.
R. Lamkins	Dodge	Trempealeau	Wisconsin.
D. C. Godfrey	Plato	Saline	Nebraska.
D. M. Camp	Ben Wade	Pawnee	Kansas.
W. E. Curtis	Brown's Grove	do	Do.
E. Royce	Pallsado	Minnehaha	Dakota.
H. D. Stockman	Woodville	Saint Croix	Wisconsin.
F. N. Robinson	Howard	Miner	Dakota.
Reuben F. Little	Richardson	Polk	Wisconsin.
I. H. Ross	Leeds	Jefferson	Alabama.
Julius Peterson	Rice Lake	Barron	Wisconsin.
E. G. Butts	Stillwater	Washington	Minnesota.
Joseph Streiff	Oakdale	do	Do.
W. H. Wood	Brookville	Saint Croix	Wisconsin.
C. J. White	New Centreville	do	Do.
Mrs. J. Klingensmith	Orangeville Mills	Barry	Michigan.
Craig W. Green	Elmira	Chemung	New York.
J. Q. Mahaffey	Lickville	Greenville	South Carolina.
S. P. Chase	Brookfield	Tioga	Pennsylvania.
A. J. Owen	Fall Brook	do	Do.
Stephen Rowcliffe	Osceola Mills	Polk	Wisconsin.
H. P. Gatchell	Asheville	Buncombe	North Carolina.
D. A. Robertson	Saint Paul	Ramsey	Minnesota.
Merrick Kendall	Kendall Station	Chemung	New York.
J. W. Van Vleet	Wilson	Saint Croix	Wisconsin.
Mrs. J. B. Edsall	Altus	Bradford	Pennsylvania.
George Healy	Rochester	Olmstead	Minnesota.
Charles S. Barney	West Union	Steuben	New York.
S. F. Riggs	Granville Summit	Bradford	Pennsylvania.
John Siskron	Darlington	Darlington	South Carolina.
I. C. Floyd	Alvin	Hamilton	Nebraska.
Samuel H. Fry	Aurora	do	Do.
D. K. Marsh	Marshfield	Tioga	Pennsylvania.
Alfred S. Brown	Wellsville	Allegany	New York.
G. E. Culver	Vermillion	Clay	Dakota.
F. A. Carlson	Apple River	Polk	Wisconsin.
William K. King	Ceres	Allegany	New York.
A. T. James	Blossburgh	Tioga	Pennsylvania.
D. P. Haight	Mountain Lake	Bradford	Do.
Gustave A. Grant	Highland	Minnehaha	Dakota.
J. N. Sheldon	Sebo	Allegany	New York.
George H. Webb	Alba	Bradford	Pennsylvania.
Hiram O. Chapin	White's Corners	Potter	Do.
W. T. Daly	Leona	Bradford	Do.
W. H. Hudson	Larabee	McKean	Do.
George P. Anderson	Bunyan	Polk	Wisconsin.
George Richardson	Bloomington	Clay	Dakota.
P. I. Burlingame	Van Ettenville	Chemung	New York.
P. A. Greeley	Stinson	Outagamie	Wisconsin.
William J. Raysdill	Saint Charles	Butler	Ohio.
F. H. Rasmussen	El Salem	Polk	Wisconsin.
W. S. Foster	Ladora	Iowa	Iowa.
Harris Taylor	Bazette	Navarro	Texas.
George G. McWhorter	Milton	Santa Rosa	Florida.
J. W. Mulliken	Dudley	Fillmore	Nebraska.
W. L. Harvey	Clifton	Lackawanna	Pennsylvania.
B. M. Hall	South Eaton	Wyoming	Do.
George W. Cooke	Beaumont	do	Do.
S. B. Hills	Gouldsborough	Lackawanna	Do.
E. A. Stevens	Green Grove	do	Do.
Edward Himrod	Hollisterville	Wayne	Do.
Thomas Johnston	Dunmore	Lackawanna	Do.
R. A. Whiteman	Milwaukee	do	Do.
Perry A. Clark	Lehman	Luzerne	Do.
John Bryant	Cherry Ridge	Wayne	Do.
F. B. Hodge	Elk City	Douglas	Nebraska.
T. B. Orchard	Wilkesbarre	Luzerne	Pennsylvania.
	Hamblinton	Wayne	Do.

*List of tornado reporters, June 30, 1885—Continued.*

Name.	Post-office.	County.	State or Territory.
W. F. Young	Littleton	Hallfax	Pennsylvania.
H. S. Freas	Wapwallopen	Luzerne	Do.
C. S. Fargo	Wanomie	do.	Do.
Charles Ekdohl	Scandia	Washington	Minnesota.
A. C. Sisson	La Plume	Lackawanna	Pennsylvania.
William Thompson	Centremoreland	Wyoming	Do.
Henry Ernst	Bellasyva	do.	Do.
W. S. Jones	Slocum	Luzerne	Do.
Theodore Day	Dyberry	Wayne	Do.
G. W. Wiedman	Amasa	Lackawanna	Do.
Charles H. Hall	Dallas	Luzerne	Do.
J. F. Wilber	Peckville	Lackawanna	Do.
George A. Silsby	Mitchell	Davison	Dakota.
A. F. Williams	Goodle	Beadle	Do.
B. J. Cannon	Drinkers	Lackawanna	Pennsylvania.
D. Stewart	Home	Turner	Dakota.
R. M. Dexter	Canova	Miner	Do.
Casper Oberdorfer	Harding	Luzerne	Pennsylvania.
George H. Fassin	Edgard	Saint John Baptist	Louisiana.
C. V. More	Winterdale	Wayne	Pennsylvania.
Albert Martin	Adelia	Turner	Dakota.
S. J. Cornell	De Witt	Sanborn	Do.
Edwin Miller	Grant City	Sac	Iowa.
James R. Van Buren	Griswoldville	Jones	Georgia.
J. W. A. Wright	Greensborough	Hale	Alabama.
E. Sawyer	Sawyerville	do.	Do.
Henry A. Taylor	Gallon	do.	Do.
W. E. Moor	Bridgetown	Shelby	Do.
C. P. Luttrell	Pearson	Fayette	Ohio.
Dana Rhodes	Groton	Tompkins	New York.
David W. Lester	Haddock Station	Jones	Georgia.
Otis Scovall	New Helena	Custer	Nebraska.
John F. Vardaman	Kellyton	Coosa	Alabama.
E. J. Blackburn	Ironville	Perry	Do.
J. R. Baxter	Lebanon	De Kalb	Do.
L. Grovitt Rhodentown	Rhodentown	do.	Do.
R. C. Willis	Burton's Hill	Greene	Do.
J. S. Hansberger	Tionus	Bibb	Do.
James F. Bailey	Marion	Perry	Do.
A. C. Copeland	Crossville	De Kalb	Do.
J. J. Parish	Adell	Berrien	Georgia.
J. J. Lee	Sand Tuck	Ellmore	Alabama.
James M. McCullough	Felix	Perry	Do.
George W. Duncan	Franklin	Simpson	Kentucky.
D. E. Antry	Dismal	Sampson	North Carolina.
G. M. Ellis	Emmetsburgh	Palo Alto	Iowa.
Thomas J. Crumley	Crossville	De Kalb	Alabama.
Alex. Gaddies	Emmetsburgh	Palo Alto	Iowa.
J. A. Yeager	Pondville	Bibb	Alabama.
W. H. Reynolds	Packaville	Clarendon	South Carolina.
R. B. Pruett	Mount Olive	Coosa	Alabama.
J. P. Harris	Harrisburgh	Bibb	Do.
George C. Mosher	1636 Summit street, Kansas City.		Missouri.
W. L. Brown	Van Alstyne	Grayson	Texas.
E. Pasome	Dallas	Gaston	North Carolina.
Ed. A. Killian	Leavenworth	Leavenworth	Kansas.
B. F. Steedman	Collinsville	Grayson	Texas.
D. Krebs	Kingston	Hunt	Do.
George H. Groves	Melissa	Collins	Do.
W. F. Felty	Hickory Creek	Fannin	Do.
Dan Van Trump	Norborne	Carroll	Missouri.
A. C. Carnes	Weston	Collin	Texas.
T. B. McCracken	Zion	Lowndes	Mississippi.
Simon Daw	Malta Bend	Saline	Missouri.
A. G. Lackey	Marshall	do.	Do.
M. M. Yeakley	Mountain Spring	Cooke	Texas.
A. E. Baum	Bollivar	Denton	Do.
R. M. Orrell	Fayetteville	Cumberland	North Carolina.
J. W. Andrews	Laurinburg	Richmond	Do.
G. E. Reeves	Pottsbrough	Grayson	Texas.
A. M. Armstrong	Crawford	McLennan	Do.
W. G. Laffender	Sioux Falls	Minnehaha	Dakota.
F. M. Makeig	Waco	McLennan	Texas.
M. Yoakum	Tehuscana	Limestone	Do.
J. I. Adams	Fatonton	Putnam	Georgia.
H. S. Austin	Plevna	Reno	Kansas.
Charles Schaefer	Lorena	McLennan	Texas.
H. F. Fowler	Basin Springs	Grayson	Do.
W. A. Rexroat	Elmont	do.	Do.
L. F. McMillan	Massey	Hill	Do.
S. Hundley	Cannon	Grayson	Do.
T. C. Carlisle	Itasca	Hill	Do.

*List of tornado reporters, June 30, 1885—Continued.*

Name.	Post-office.	County.	State or Territory.
Hawley Gerrells.....	Indian Gap.....	Hamilton.....	Texas.
L. M. Kingsley.....	Boqueville.....	McLennan.....	Do.
John A. Eakins.....	Hico.....	Hamilton.....	Do.
Thomas F. Loader.....	Iredell.....	Boque.....	Do.
H. C. O'Hara.....	Reno Centre.....	Reno.....	Kansas.
E. L. Drake.....	Kansas Centre.....	Rice.....	Do.
T. S. Hawkins.....	Centre City.....	Hamilton.....	Texas.
L. H. McKee.....	Robinson.....	McLennan.....	Do.
J. C. Wyatt.....	Speegleville.....	do.....	Do.
B. Franklin Abrams.....	277 Broadway, Brook- lyn.....	do.....	New York.
George G. Valentine.....	Kingsville.....	Johnson.....	Missouri.
I. D. Graham.....	Manhattan.....	Riley.....	Kansas.
William Ellison.....	Bazette.....	Navarro.....	Texas.
J. E. Bainfield.....	Arrington.....	Atchison.....	Kansas.
F. J. Kirkham.....	Stranger.....	Falls.....	Texas.
L. W. Dennen.....	Havensville.....	Pottawatomie.....	Kansas.
E. W. Kenyon.....	Netawaka.....	Jackson.....	Do.
J. W. Lord.....	New Douglas.....	Madison.....	Illinois.
Benj. McElroy.....	Frankfort.....	Marshall.....	Kansas.
T. Y. Frost.....	Whiting.....	Jackson.....	Do.
D. G. Woodworth.....	Larkin.....	Atchison.....	Do.
H. C. Rogers.....	Gordonville.....	Grayson.....	Texas.
I. P. Allen.....	Pleasant Plain.....	Osborne.....	Kansas.
R. E. Guthrie.....	Guthrieville.....	York.....	South Carolina.
G. Pierce.....	Cottageville.....	Colleton.....	Do.
H. L. Brown.....	Invermay.....	Atchison.....	Kansas.
J. L. Hoskins.....	Hoskins.....	Rooks.....	Do.
Isaac Hoch.....	De Soto.....	Dallas.....	Iowa.
James Washburn.....	Buck Creek.....	Richland.....	Wisconsin.
Benj. Tripp.....	Grand Centre.....	Osborne.....	Kansas.
J. M. Fike.....	Stockton.....	Rooks.....	Do.
N. E. Blue.....	Ontario.....	Jackson.....	Do.
John L. Harvey.....	Marne.....	Cass.....	Iowa.
Jacob Kerper.....	New Vienna.....	Dubuque.....	Do.
F. A. Pope.....	Caledonia.....	Houston.....	Minnesota.
J. W. Beatty.....	Cascade.....	Dubuque.....	Iowa.
O. H. Carroll.....	Ross Station.....	Colleton.....	South Carolina.
Thos. J. Powers.....	Sterling.....	Rice.....	Kansas.
R. L. Rowe.....	Cherokee.....	Cherokee.....	Iowa.
J. H. Montgomery.....	Meadville.....	Crawford.....	Pennsylvania.
James Kelly.....	Wyoming.....	Marshall.....	Kansas.

## APPENDIX 66 E.

*Details relative to progress in bibliography.*

[Prepared by Mr. C. J. Sawyer, Bibliographer].

## I. SOURCES OF NEW TITLES.

	Number of titles.
Royal Society, Catalogue of scientific papers, vii, viii. L., 1877, '79.....	4,488
Reuss, Repertorium commentationum, iv, Physica. Gott., 1805.....	1,384
Poggendorff, Biographisch literarisches Handwörterbuch. Lpz., 1883. 2 volumes.....	1,000
Hellmann, Repertorium der Deutschen Meteorologie. Lpz., 1883.....	5,200
Bibliographies, catalogues, &c., 141 volumes.....	1,487
Manuscript lists and bibliographies.....	1,082
Periodicals indexed, 2,203 volumes.....	5,697
Total added.....	20,338
Number on hand July 1, 1884, about.....	26,853
Total July 1, 1885, about.....	47,191
10048 SIG—38	

## II. INSTITUTIONS AND INDIVIDUALS TO WHOM THE OFFICE IS INDEBTED FOR IMPORTANT CONTRIBUTIONS.

### SPECIAL BIBLIOGRAPHIES.

Denmark: Manuscript, from C. Brunn, librarian Royal Library, Copenhagen.

German Empire: Dr. Hellmann has kindly permitted the incorporation of his admirable Repertorium.

Japan: Manuscript, from Dr. E. Knipping.

Norway: Manuscript, from Prof. H. Mohn.

Poland: Manuscript, from Dr. F. Karlinaki.

Portugal: Manuscript, from J. C. de Brito Capello.

Roumania: Manuscript, from Dr. S. C. Hepites.

Russia: Manuscript, from Profs. H. Wild and A. Woelfkof.

Spain: Manuscript, from Don C. Pujazon and M. Merino.

Styria: Manuscript, from Prof. R. von Miller-Hauenfels.

Sweden: Manuscript, from C. Annerstedt, librarian University Library, Upsala.

Victoria: Manuscript, from R. L. J. Ellery.

### EXTRACTS FROM MANUSCRIPT CATALOGUES.

Library of the Deutsche Seewarte, from Dr. George Neumayer.

Library of the Central Anstalt, Vienna, from Dr. J. Hann.

Library of the Universiteit van Amsterdam, from Dr. H. G. Rogge.

Library of the Meteorological Office, London, from R. H. Scott.

Library of Yale College, from Prof. E. Loomis.

Astor, Boston Public, and Harvard College libraries, from their librarians.

The librarians of the American Philosophical Society, Academy of Natural Sciences, Ridgeway Branch of Philadelphia Library Company, and the Mercantile Library of Philadelphia; of the Peabody Institute and Johns Hopkins University, of Baltimore; and of the Library of Congress, have afforded special facilities for the collection of material.

Valuable printed catalogues have been received from the Nederlandsch meteorologisch Instituut, Utrecht; Ufficio centrale di Meteorologia, Rome; Osservatorio di Capodimonte, Naples; Société de Physique et d'Histoire Naturelle de Genève, through Prof. A. de Candolle; Service hydrometrique du Bassin de la Seine, Paris, through M. G. Lemoine; Akademie der Wissenschaften, Munich; Nicolai Haupt-Sternwarte, Pulkowa; Finska Vetenskaps Societeten, Helsingfors; Institution of Civil Engineers, London; American Philosophical Society, Franklin Institute, American Antiquarian Society, and others.

### MISCELLANEOUS CONTRIBUTIONS.

Prof. G. J. Symons has added to his original catalogue a large number of anonymous titles; Dr. Sophus Tromholt has furnished a list of titles on the aurora; Lieut. Jules de Schokalsky, of the Russian Navy, has very kindly indexed for us the complete set of the Moskoi Sbornik, adding translations of titles; Prof. C. Pittei, of Florence, has contributed Italian titles; R. Mueller, director of the Hydrographic Office at Pola, an index to their publications.

In this country the late Dr. F. B. Hough furnished an index to the contents of volumes in his valuable library; Prof. M. W. Harrington kindly loaned his extensive card-working index for comparison; Dr. H. B. Baker indexed the publications of the Michigan State board of health, and many others have assisted in this work by short lists and valuable suggestions.

## APPENDIX 67.

*REPORT OF PHYSICAL LABORATORY DIVISION FOR 1884-'85.***THE CHIEF SIGNAL OFFICER, UNITED STATES ARMY:**

SIR: I have the honor to submit the following report of the principal operations of the Physical Laboratory Division for the year ending June 30, 1885:

This division was known as the Meteorological Observatory up to January 19, 1885. On that day the experimental laboratory, which was in process of formation, was consolidated with it, the name was changed as above, and the writer was put in charge, relieving Lieutenant Allen. Owing to this change, the report, in so far as it refers to the first six months of the year, cannot be so full and satisfactory as it would have been had Lieutenant Allen remained to aid in its preparation.

This division is charged with "the custody of all meteorological instruments, and their examination and repair; the preservation, comparison, and adjustment of standards and substandards; the testing of all instruments issued for station use, and the determination of their corrections; and with the inauguration of a system of measurements of atmospheric electricity, ground currents, and earth temperatures, and the supervision of men assigned to this work. To it may be referred any questions involving experimental research, and especially those pertaining to the subjects of electricity and heat." (Instructions No. 6, 1885.)

The total number of instruments of all kinds received by the division during the year was 1,945, of which over 1,600 were thermometers. This number includes all that were purchased by the office and all that were returned from stations for comparison, &c., and a small number received from private individuals. There were issued to stations and volunteer observers 2,045, and to private individuals 283, making a total issued of 2,328. Of the instruments issued, over 1,700 were thermometers. This statement does not include wind-vanes and rain-gauges, which until recently were received and issued by the property and disbursing officer without passing through this division.

During the year, 1,838 thermometers were compared with the office standards, and a correction card prepared for issue with each. Two hundred and thirty of these comparisons were made for private individuals. All of the barometers issued were compared with the standards, 160 barometer tubes were filled and boiled, and 109 barometers were repaired. Most of the self-registering instruments kept in what is known as the "instrument room" have been continuously at work during the year, and continuous registers of temperature, pressure, rain, and wind at this office have been filed away. Frequent comparisons with non-registering standards, the results of which are noted on the record sheets, render these records of great value, and it is only to be regretted that the Service is unable at present to largely extend the system of self-registry.

Plans for the improvement of the apparatus for the comparison of thermometers are now under consideration. Although the methods now in use are extremely satisfactory as to the results obtained, the apparatus is rather crude, and its use involves more time and labor than is actually necessary. There are still some thermometers in use in the service which have not been compared with the standards of the office.

The work of comparison has been carried on as rapidly as possible without a considerable increase in the stock of thermometers carried by the office, as it is always necessary to issue instruments to take the place of those called in.

The improvement of the rain gauge used in the service is a subject to which much attention has been given during the year. As a result a new model gauge has been constructed, and, upon being recommended by the board on instruments, has been adopted. In the future all gauges issued will conform to this model.

The principal points of difference between this gauge and the old are a change in the material of the collector and the tube and a great increase in the strength and rigidity of the same. The collector is of heavy brass, 8 inches in diameter, beveled on the outside so as to give it a tolerably sharp edge. The tube into which the water flows is also of brass, thick and strong, 20 inches deep, and its diameter is such that the ratio of the area of the collector to that of the tube is as nearly as possible ten to one. A new stick has also been adopted, graduated much more accurately than the old and of a different

kind of wood, which shows the water line much more distinctly and accurately. In cross-section it is so made as to be just 1 per cent. of the area of the tube. The new gauges will also be numbered and calibrated, so that a correction card can be furnished with each, and it is believed that their introduction will increase the accuracy of our observations of rainfall.

A new anemometer-support has been devised and adopted, which is believed to be a great improvement upon the old form. In the new support a cross-bar, upon which the anemometer rests, is run up and down a T-shaped bar of iron, by means of a chain, with which the observer controls the motion. The cross-bar is arranged to support two anemometers, so that monthly comparisons of the station and extra instrument can readily be made.

Arrangements are also made for the easy addition of a third arm, in order to facilitate comparison with anemometers carried by the inspectors. The adoption of this new support is thought to be an important step in the direction of a much-needed improvement in anemometry. Improvements in the anemometer itself are also under consideration, which will strengthen its weaker parts and diminish the number of damaged instruments annually returned to this office.

Experiments are in progress looking to the substitution of an iron cistern with metal plunger for the leather barometer cistern now in use. The latter are constantly giving way and the expense of repair is considerable.

The relative value of spherical and cylindrical bulbs for thermometers has been the subject of experiment and consideration. Tests of sensitiveness have been made in air and in water, and as dry and wet bulbs. In all experiments the superiority of the cylindrical bulb was demonstrated. The subject has been specially referred to Professor Ferrel and Junior Professor Russell, and although no formal report has as yet been made, it seems highly probable that the use of the cylindrical bulb in preference to the spherical will be recommended. Should the cylindrical bulb be adopted the change can be brought about gradually, and it will also enable the office to utilize a large number of cylindrical bulb thermometers, "hygro-tubes," so called, which were called in some time ago on account of not being stem-graduated.

Junior Professor Russell, who has had the subject of the standard of thermometry under consideration for two years or more, has nearly completed a paper containing an account of his work in detail and a full discussion of the whole question. The non-arrival of a few thermometers, specially made and compared at low temperatures with the Kew standards, is the cause of the delay in forwarding this paper to the Chief Signal Officer.

Reference has been made from time to time in the report of the Chief Signal Officer to the efforts of the office to establish a normal barometer. The continued illness of Junior Professor Waldo has prevented the preparation of a report which he was expected to make upon European standards, and the comparisons made by him of barometers belonging to this office with several of the most important normal barometers of Europe. Little progress has been made, therefore, during the year in this direction. The model constructed by Professor Wright, of New Haven, has been examined by the writer, and steps looking to the construction of a suitable cathetometer have been taken. The increased appropriation for the manufacture and repair of instruments, which became available on July 1, will enable the office, it is hoped, to carry out well-matured plans for the erection of this important instrument.

The subject of hygrometry and the improvement of hygrometric observations and tables has received the attention of the office for several years. In March, 1885, Junior Professor Marvin, attached to this division, was sent to Colorado Springs and Pike's Peak for the purpose of making a complete series of observations at various altitudes with various forms of psychrometer. He has made weekly reports to this office, giving the results of his work in detail. These results have been placed in the hands of Professor Ferrel, to whom the duty of discussing them has been assigned. The work thus far appears to be eminently successful. Professor Marvin will complete his observations on the mountain about August 10. After his return to this office it is intended to supplement the observations made at Pike's Peak and elsewhere by such experiments and researches in this laboratory as may seem desirable.

A series of four balloon ascents in the interests of meteorology were made by Private Hammon, attached to this division, in January, March, and April. The point of departure was in all cases Philadelphia, the dates and places of landing being as follows: First ascent, January 19, 1885, landing at Manahawken, N. J.; second ascent, March 13, 1885, landing near Birdsborough, Pa.; third ascent, March 27, 1885, landing at Tremley, near Rahway, N. J.; fourth ascent, April 16, 1885, landing at Williamstown, N. J.

The general instructions governing Mr. Hammon in these ascents were given by Professor Abbe, in charge of the study-room division. Mr. Hammon has made a full report of this work which has been referred to Professor Abbe for examination and remark.



When the writer was put in charge of the work of this division, two stations for the study of atmospheric electricity had already been established—one at Baltimore, in connection with the Johns Hopkins University, and the other at Cambridge, Mass., in connection with Harvard University.

The work of the observer at Baltimore, Private Park Morrill, was under the immediate supervision of Professor Rowland. At Cambridge the work of Privates McRae and McAdie was under the direction of Professor Trowbridge. At Baltimore, by means of a Mascart mirror electrometer, a continuous photographic record of the potential of the atmosphere has been maintained. Mr. Morrill, in Signal Service Note, No. XVII, has discussed the method of observation and has given the results of some studies of the connection between variations in potential and other meteorological elements. Experiments have also been made in the direction of the improvement of the water-dropping collector, or rather the substitution of a mechanical collector for the water dropper. The latter is practically useless in the winter season, and it is believed that a mechanical collector can be devised which will be equally as efficient at all times and suitable for use in all climates. Patterns have been made for one designed at Baltimore, and the construction of a model will probably be undertaken. Experiments have also been made at Baltimore to determine the best form of charging batteries for the electrometer, but no definite conclusion has yet been reached.

At Cambridge much attention has been given to the study of different forms of electrometers. Two instruments designed by Professor Trowbridge have been made and tested with very satisfactory results. Interesting experiments have also been made in determining the potential of the atmosphere by means of kites. These have been used in Cambridge and also on the summit of Blue Hill near Boston. At the latter point very high differences of potential between the earth and the string holding the kite were found, and some very interesting observations were made.

During the progress of this work at Baltimore and Cambridge Professors Rowland and Trowbridge have taken great interest in it and much of its success must be attributed to their hearty co operation with the service, and to the facilities so generously afforded by the authorities of Johns Hopkins University and of Harvard University.

Recently the subject has been taken up in the laboratory of this division. No attempt will be made for the present to secure a continuous photographic record as it seems more desirable to make at first a thorough investigation of instruments and methods. With that end in view several electrometers have been ordered, only one being available at present. Various questions connected with collectors, electrometers, exposure, &c., will be investigated. When uniform and satisfactory results are attainable and by the simplest means, the establishment of several additional stations in different parts of the country will be recommended.

The selection and construction of suitable thermometers for the measurement of ground temperatures has received a good deal of attention. Several forms of electric thermometer have been made the subject of experiment. A careful test of the thermo-electric method has shown that it is too uncertain in its results for general use. A form of resistance thermometer has been constructed which promises to give excellent satisfaction, and a new form of differential resistance thermometer has been devised which seems to possess many advantages over any other method. A practical test of these thermometers will be made at an early date which will be sufficiently prolonged to enable us to decide with certainty upon their efficiency.

There is great and pressing need for a suitable building in which the work of the physical laboratory division can be concentrated and rendered vastly more efficient. It is now carried on in several rooms, not connected with each other and all quite unsuitable for the work assigned to them. The constantly increasing demands which are made upon this experimental branch of the service can only be satisfied when ampler room and better facilities are afforded. It must constantly be a source of regret that, in the present condition of the division with its limitations as to room and facilities, it is impossible to take up some of the most important experimental problems which arise in the service.

Respectfully,

T. C. MENDENHALL,

*Professor and Assistant-in-charge of Physical Laboratory Division.*

JULY 27, 1885.

## APPENDIX 68.

**REPORT OF OFFICER IN CHARGE OF PROPERTY AND DISBURSING DIVISION.**

SIGNAL OFFICE, WAR DEPARTMENT,  
Washington City, July 15, 1885.

SIR: I have the honor to submit the following statement of the work of the Property and Disbursing Division for the fiscal year ended June 30, 1885, as required for the Annual Report of the Chief Signal Officer.

No changes of importance have occurred in the *personnel* of the division since last report.

Two hundred and twelve dollars and thirty-five cents have been received, during the year, from the sales of maps and bulletins, as allowed by the act of Congress approved March 30, 1874 (section 227, Revised Statutes).

In the "settlement of accounts room" the pay accounts of the entire corps have been examined, prepared for settlement, and through this room settled, aggregating 10,278 accounts.

The number of accounts growing out of the disbursement of the regular appropriations expended by this office, settled during the year, has been 7,976, making an average number per month of 664. This is caused by the large number of stations and the character of the accounts incurred at each, they being for small items of rent, hire, &c., which require monthly or quarterly payment.

The improved methods of administering the duties of this division have continued, and have resulted in the gratifying fact that the accounts pass the very critical scrutiny of the accounting officers of the Treasury with few suspensions, and these for mere technical informalities.

One of the reforms instituted by me was to pay all vouchers by checks drawn to order, in no case to bearer, that mode being considered the safest, not only of transmitting money, but it also furnishes the assurance (as the checks have to be indorsed by the person in whose name drawn before payment) that the money reaches the person for whom intended.

The advantage afforded to obtain greater accuracy by having instruments compared with our standards for which no extra charge is made, still continues to induce many private persons, institutions of learning, &c., to purchase instruments through this office, and during the year there have been 247 instruments of various kinds purchased, representing a total cost of \$1,888.55. These transactions have no connection with the public funds disbursed by me.

Six hundred and seventy instruments of various kinds have been purchased during the year for the use of this service, and 1,639 have been issued since last report.

The average cost of maintaining each station of observation during the year, including cost of printing stations and additional cost of life-saving stations, but exclusive of the cost of telegraphic services and the pay and allowances of the men on duty at each, has been \$329.54, but this cost, as well as that reported in previous reports, represents only the amount spent at each station, and is therefore calculated to convey an erroneous impression; the absolute average is about \$1,500 per annum for each station (which includes all expenses, except pay and allowances of the men).

The total number of letters received during the year was 37,954, an increase over last year of 5,445 letters; the total number of letters sent was 33,330, and 2,710 indorsements, an increase in letters sent of 4,482 over last year.

In the "packing and shipping room" there were 18,080 distinct shipments made, through the Quartermaster's Department, by express, and by mail, with not an article lost in transit.

There were received, during the year, 5,241 packages.

The usual quantity of work has been done in the "machine shops," in manufacturing and repairing meteorological and other instruments, and in repairs about the office.

The "carpenter shop" has been kept busy in making the necessary packing boxes for shipment of supplies, &c., and jobbing and repairs about the office.

The "library" has received during the year by purchase, exchange, or gift, 1,027 books, and now contains 9,743 volumes.

The condition of the appropriations (disbursed by this office) for the fiscal year ending June 30, 1885, with expenditures thereunder and balances unexpended at the end of the year, with probable demands on such balances as required to be rendered by act of Congress approved May 1, 1829, is as follows:

APPROPRIATED.	
Observation and report of storms.....	\$241,000 00
Expenses Signal Service, United States Army.....	5,000 00
Maintenance and repair military telegraph line.....	24,000 00
Establishing stations, Island of Nantucket.....	40,000 00

EXPENDED.	
Observation and report of storms.....	\$146,546 02
Expenses Signal Service, United States Army.....	1,578 37
Maintenance and repair military telegraph line.....	19,768 02
Establishing station, Island of Nantucket.....	.....

BALANCES.	
Observation and report of storms.....	\$94,453 98
Expenses Signal Service, United States Army.....	3,421 63
Maintenance and repair military telegraph line.....	4,231 98
Establishing stations, Island of Nantucket.....	40,000 00

PROBABLE DEMANDS.	
Observation and report of storms.....	\$60,000 00
Expenses Signal Service, United States Army.....	3,421 63
Maintenance and repair military telegraph lines.....	4,231 98
Establishing stations, Island of Nantucket.....	40,000 00

On July 1, 1884, there were employed in the division, 74 men (40 enlisted and 34 civilians, the latter including all messengers and laborers); on June 30, 1885, there were only 67 men (35 enlisted and 32 civilians, the latter including all messengers and laborers), showing a decrease of 5 enlisted men and 2 civilians.

At the close of the fiscal year ending June 30, 1884, there were 60 telegraph stations in operation, 4 having been closed during the year ending June 30, 1885, and 2 having been added, making a total of 77 stations in operation on June 30, 1885, reporting to this office.

The receipts from the 77 stations during the year were \$16,399.50, of which the sum of \$8,332.63 was collected for and paid to other lines.

The money value of "free business" (official messages), if paid for, would have been \$10,695.90.

During the year 5,080 forms have been received from the telegraph stations and examined.

The amounts appropriated under the different heads for the support of the Signal Service, United States Army, for the fiscal year ending June 30, 1885, are as follows:

Legislative, executive, and judicial:

Regular clerks, messengers, &c.....	\$10,660 00
Scientific experts, clerks, &c.....	45,000 00
Postage-stamps Postal Union countries, allotted by the Secretary of War.....	1,080 00
Stationery, allotted by the Secretary of War.....	3,563 34
Contingent expenses, allotted by the Secretary of War.....	7,017 49
Rent of buildings for Signal Office.....	7,000 00

Total.....	74,340 83
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Sundry Civil expenses:

Observation and report of storms:

Manufacture, purchase, and repair of instruments.....	\$5,500 00
Telegraphing reports.....	138,000 00
Expenses storm signals.....	10,000 00
Cotton-belt reports.....	7,000 00
Connection life-saving stations.....	5,500 00
Instrument shelters.....	2,000 00
Rents, &c., of offices outside of Washington.....	40,000 00
River and flood reports.....	10,000 00
Maps and bulletins.....	25,000 00

Total.....	341,000 00
Maintenance and repair military telegraph lines.....	24,000 00
Stations at Nantucket Island.....	40,000 00

<b>Support of the Army:</b>	
Expenses Signal Service, United States Army.....	\$5,000 00
<b>Pay, &amp;c., of the Signal Corps:</b>	
Pay of officers .....	30,500 00
Pay of enlisted men .....	200,000 00
Mileage to officers .....	5,000 00
Cost of telegrams .....	250 00
Pay of contract surgeon .....	1,200 00
Commutation of quarters to officers .....	8,208 00
<b>Total</b> .....	245,158 00
<b>Subsistence Department:</b>	
Subsistence and commutation of rations, Signal Corps.....	155,000 00
<b>Quartermaster's Department:</b>	
<b>Regular supplies:</b>	
Fuel .....	6,200 00
Commutation of fuel at \$9 per month .....	23,760 00
Commutation of fuel at \$8 per month .....	23,328 00
Forage for animals .....	3,100 00
Straw for animals .....	217 00
Straw for bedding .....	46 08
Stationery at Fort Myer .....	100 00
Stores and repairs to heating apparatus .....	600 00
Lights at Fort Myer .....	300 00
<b>Total</b> .....	57,651 08
<b>Incidental expenses:</b>	
Office furniture, Fort Myer, Virginia .....	100 00
Horse and mule shoes .....	500 00
Blacksmiths' and other tools .....	400 00
Veterinary supplies .....	300 00
Fire apparatus and disinfectants .....	200 00
<b>Total</b> .....	1,500 00
For interment of officers and men .....	200 00
For apprehension of deserters .....	120 00
<b>Transportation:</b>	
Materials and funds .....	25,000 00
Men .....	8,875 00
Means of transportation, mules .....	1,000 00
Means of transportation, harness .....	130 00
Means of transportation, repairs to .....	500 00
<b>Total</b> .....	35,505 00
<b>Barracks and quarters:</b>	
Commutation of quarters .....	84,108 00
Work and supplies at Fort Myer, Virginia .....	1,500 00
Work and supplies on hospital .....	300 00
<b>Total</b> .....	85,908 00
<b>Clothing, camp and garrison equipage:</b>	
Six wall tents, &c .....	415 80
Issues in kind .....	4,900 00
<b>Total</b> .....	5,315 80
<b>Medical Department:</b>	
Medical attendance, &c., officers and men .....	5,000 00
Medical attendance, &c., officers with Signal Corps .....	100 00
Medical and hospital supplies, Fort Myer .....	700 00
Medicine from depots, &c .....	1,000 00
Material for repairs to hospital .....	200 00
<b>Total</b> .....	7,000 00
Printing and binding (allotted by Secretary of War) about...	40,000 00
<b>Grand total</b> .....	1,017,698 17

The appropriation for fuel was not sufficient for our stations, many of which, in the extreme northwest country, require fires the year round, and in those latitudes the cost of fuel is proportionately high; the officers of the service have been allowed, by paragraph 1851 Army Regulations, to purchase fuel at a fixed rate, the Government paying the difference, but, by the insufficiency of the appropriation mentioned, this privilege has been denied to them for a portion of the time.

As questions have arisen as to the law under which the printing of the professional papers, &c., of this service is done, I would suggest that Congress be asked to appropriate hereafter, specifically in the appropriations, both for "maps and bulletin" and for "printing and binding," using the language of our estimates. (See pp. 180 and 199, Ex. Doc. No. 5, H. R., 48th Congress, second session.)

In regard to my responsibility for the property belonging to this service, I would say that under the present rules each article purchased is taken up on a property report which is rendered quarterly to the Chief Signal Officer for transmission to the Third Auditor of the Treasury, so that not one article, from the merest trifle to the most expensive instrument that is bought, but what is carefully reported every three months to the accounting officers of the Treasury; and when it is considered that the property is scattered over the United States at all the stations of this service, and that frequent inventories have demonstrated the absolute accuracy of my reports, the vast amount of care required to produce such a result can be more readily appreciated.

In connection with the above I would say that the store-houses for the valuable instruments and other property at this office are leaky, wooden sheds, entirely inadequate, insecure, and unsafe for the storage of valuable Government property; and as during the year a fire in one of the buildings occupied by this office came near destroying a very valuable lot of records (it did destroy considerable furniture and instruments), I would invite attention to the estimate, twice before submitted to Congress, for the purchase of a site and the erection thereon of a fire-proof building for offices suitable for the uses of the Signal Service, as per plan and estimate contained in Senate Ex. Doc. No. 152, Forty-eighth Congress, first session, and would suggest that said estimate be again submitted and, for the reasons given, an appropriation urged.

As Special Orders No. 90, Adjutant-General's Office, 1885, relieved me, at my request, on the 30th day of June, 1885, from duty at this office, it is proper for me to say, in transferring the duties of my division to my successor, that the work is well up to date, except in one or two cases of indexing and in the completion of the inspection reports of the officers recently returned from inspection tours; but in these cases the additional labor of a complete inventory incident to the transfer, as well as a somewhat limited force of clerks, are the causes.

I would call to the attention of the Chief Signal Officer the efficient service rendered me by my chief clerk, Mr. W. R. Bushby, and the chiefs of subdivisions and other men employed in this division.

They are, generally speaking, all good, deserving men.

Very respectfully, your obedient servant,

S. M. MILLS,

*Captain, Fifth Artillery,*

*Late P. and D. Officer, Signal Service, U. S. A.*

THE CHIEF SIGNAL OFFICER OF THE ARMY,  
*Washington, D. C.*

## APPENDIX 69.

## REPORT OF OFFICER IN CHARGE OF EXAMINER'S DIVISION.

SIGNAL OFFICE,  
Washington City, July 16, 1885.

SIR: In accordance with instructions contained in Memorandum No. 121, dated Signal Office, July 7, 1885, I have the honor to submit the following report for the fiscal year ending June 30, 1885.

The examiner's division, which was instituted by Instructions No. 176, series of 1881, was at the beginning of the fiscal year under charge of First Lieut. P. H. Ray, Eighth Infantry, Acting Signal Officer, United States Army, and so continued until March 6, 1885, when I assumed charge, in accordance with Memorandum No. 35, dated Signal Office, March 2, 1885.

Sergt. Otto Holtnorth was chief clerk until December 20, 1884, when he was relieved from duty in the division, Sergt. James B. Newlin being assigned to succeed him by memorandum dated Signal Office, December 27, 1884.

Besides the chief clerk the regular working force of the division consists of one civilian and one enlisted clerk; but on April 29, 1885, two additional men were temporarily assigned to assist in bringing up the back work of the division, which at the time I assumed charge was in most particulars from six to eight months behind. With the assistance of these men and the steady, industrious work of the regular force the work (with a few exceptions, where irregularities exist, which are in course of adjustment) has been brought up to date.

One of these men was relieved on June 26 and returned to the division from whence he came, his services being no longer needed, and the other one continued on duty at the close of the year.

The work performed during the year is briefly set forth in the following summary.

## Summary.

Month.	Returns of signal equipments and stores examined and forwarded to the United States Treasury.	Letters sent in connection with the examination of money and property returns.	Letters received and recorded.	Requisitions for purchases and expenditures received, examined, and recorded.	Purchase-vouchers audited and recorded.	Expenditure-vouchers audited and recorded.	Accounts current, line receipts examined and forwarded to the United States Treasury.	Weekly statements of public funds recorded and verified.	Accounts current of Capt. S. M. Mills, property and disbursing officer, for appropriations audited and forwarded to the United States Treasury.	Accounts current for sales at auction, audited and forwarded to the United States Treasury.
1884:										
July.....	30	359	227	474	105	716	10	20	2	0
August.....	160	283	75	352	98	599	13	16	2	0
September.....	58	161	93	298	143	780	5	20	4	0
October.....	102	367	239	294	123	731	5	14	0	0
November.....	0	83	105	222	153	656	8	15	2	0
December.....	13	86	120	349	230	519	0	14	0	0
1885:										
January.....	48	305	263	305	147	574	0	10	0	0
February.....	185	300	106	190	135	294	0	12	1	0
March.....	152	319	100	288	149	455	5	13	1	2
April.....	111	398	371	281	118	489	3	14	1	0
May.....	124	368	135	237	161	415	4	11	5	0
June.....	29	145	111	165	8	201	0	14	2	0
Total.....	*1,012	3,174	1,844	3,455	1,569	6,419	*67	173	*20	2

\* These figures do not, however, represent the actual number of papers handled, as in nearly every instance the returns and accounts are accompanied by numbers of vouchers and sub-vouchers varying from one or two to upwards of a thousand in some of the money accounts of Capt. S. M. Mills, Fifth Artillery, property and disbursing officer, where the number of papers pertaining to each account has averaged about eight hundred, or about sixteen thousand papers for the twenty accounts of his examined during the year, which do not appear as a separate item in the summary.

The duties of the examiner's division consist in a careful scrutiny of all letters of authority (technically termed requisitions) and vouchers, and a thorough and complete examination of all money accounts and property returns pertaining to the Signal Service previously to forwarding them to the Third Auditor of the Treasury.

Formal letters of authority (requisitions) for all purchases and expenditures are prepared by the property and disbursing officer and sent to the examiner's division, where, if after examination they are found to be proper and according to regulations, they are, if for a less sum than \$100, indorsed on their faces, "E. O. No. —. By order of the Chief Signal Officer," and signed officially by the examining officer; but those for \$100 and over are signed by the Chief Signal Officer, and are then given an E. O. No. —, and recorded. After being passed by the examiner, the letters of authority are returned to the property and disbursing officer.

In cases where bills are rendered for amounts greater than the letter of authority calls for, if after examination the account is found to be correct, and the additional amount was inseparable from the amount authorized, and could not have been anticipated, the letters of authority are, on request of the property and disbursing officer, stamped "Increased, by order of the Chief Signal Officer, from \$—— to \$——," and officially signed by the examining officer, and are then returned to the property and disbursing officer.

All vouchers are carefully examined with the original bills and letters of authority, and when satisfied that the articles purchased have been delivered, or that the services charged for have been rendered, or that payment has been ordered under the signature of the Chief Signal Officer, where no previous authority exists, those for sums of less than \$100 are stamped "Approved. \$——. By order of the Chief Signal Officer, E. O. No. —," and officially signed by the examiner, and are then returned to the property and disbursing officer for payment.

All vouchers for \$100 and over when found to be correct are approved under the autograph signature of the Chief Signal Officer, and in no case is a voucher approved where its amount exceeds that of the original letter of authority.

Telegraph services are rendered without formal requisition, and the original bills for the same, after having been examined, corrected, and audited by the officer in charge of the telegraph division, and after having received the approval of the Chief Signal Officer, are, together with vouchers prepared by the property and disbursing officer, sent to the examiner's division, where, after proper scrutiny, the vouchers are, if found correct, stamped for approval in the same manner as for other vouchers.

All vouchers as well as requisitions are recorded in serial order, beginning with No. 1, at the commencement of the calendar year, the purchase vouchers being recorded in the record of purchases, and those for expenditures in the record of persons and articles hired. All money accounts of officers of the service disbursing public money are examined as to their correctness, and to see that all regulations of the Treasury and the office, as laid down in Instructions No. 15, dated Signal Office, March 1, 1885, are complied with. All differences are noted, and at the end of the examination a statement of them is furnished to the officer accountable, and the account is held until the differences have all been adjusted.

The purchases pertaining to each account are checked off on the property return of the officer making them, to see that everything is properly accounted for, and the expenditures on the descriptive lists of persons and articles hired, of the officer, to be assured that the services charged for are properly reported.

The expenditure vouchers of the property and disbursing officer are checked off on the record of persons and articles hired (which corresponds with the descriptive lists of persons and articles hired of other officers) in this office, annotation being made in connection with each service, in a column for the purpose, in red ink, as for example, viz: "V. 45—6-25-85.—M.," which indicate that the account was paid on voucher No. 45, on June 25, 1885, by Capt. S. M. Mills, and that the voucher so paid pertains to his June, 1885, accounts as the date indicates.

When this has been done, the services are considered as reported, as per instructions from the Chief Signal Officer, dated February 24, 1885.

After differences have been adjusted and all regulations complied with the accounts are forwarded by letter of transmittal to the Third Auditor of the Treasury, with a statement that the accounts have been examined and found correct.

The returns of officers responsible for Signal property (of which there are upwards of 200) are examined by seeing that all property on hand at the last return is correctly carried forward to the next succeeding return; that all property received (from whatever source) is taken up and accounted for; that all property dropped is done so on proper and legal vouchers, and that the amount on hand to be accounted for is correctly stated.

When the correctness of returns has been ascertained those for the preceding quarter are forwarded to the Third Auditor of the Treasury for settlement, and those for the current quarter held to see that the property on hand is properly carried forward to the next subsequent return.

I am, very respectfully, your obedient servant,

FRANK GREENE,

*Second Lieutenant, Signal Corps, U. S. A.*

The CHIEF SIGNAL OFFICER, UNITED STATES ARMY.



## APPENDIX 70.

## REPORT OF OFFICER IN CHARGE OF PUBLICATIONS DIVISION.

SIGNAL OFFICE, WAR DEPARTMENT,  
Washington, D. C., July 1, 1885.

SIR: I have the honor to submit the following report relative to the publications division for the fiscal year ending June 30, 1885:

The work of the division naturally consists of three distinct classes of labor, draughting, printing, and distribution, each of which has been assigned to an appropriate subdivision, whose employes are specially fitted to perform their respective duties. The general work of the division has been materially increased during the year. This is due chiefly to the greater demand, both at home and abroad, for the publications of the Service, which has necessitated larger editions and proportional increase in labor. The following synopsis of the work performed in the respective subdivisions is respectfully submitted:

## DRAUGHTING ROOMS.

During the year the employes herein have reduced by pantograph 2,500 maps, constructed and drawn 610 maps and charts, prepared for transfer to stone 560 maps, and mounted 125 maps; and the sergeant in charge (chief draughtsman) has examined and compared 400,000 maps and charts after they had been printed. In addition to these meteorological data, collected from stations of observation distributed over the entire northern hemisphere and from vessels crossing the seas, have been entered upon maps specially designed therefor; and isobars and isotherms drawn thereon for every day in the year. Monthly means have also been deduced from these daily observations and charted for each month in the year.

## PRINTING ROOMS.

The following tabular statement will show the work performed herein:

Publication.	No. printed.	Publication.	No. printed.
Daily Bulletin of International Observations.....	184,184	Post-office wrappers.....	2,636,900
Summary and Review of International Observations.....	7,380	Envelopes.....	576,000
Monthly weather review.....	30,890	Forms (miscellaneous).....	415,610
Midnight synopsis and special bulletin.....	152,754	Letters.....	19,000
Professional papers.....	3,500	Letter-heads.....	8,350
Signal Service notes.....	22,650	Special bulletins (monthly).....	2,115
History of the Service.....	5,000	Address slips.....	50,400
Tornado circulars.....	6,250	Cold-wave circulars.....	18,000
General orders.....	44,750	Advance annual reports.....	1,500
Special orders.....	17,785	Instructions to special river observers.....	600
Instructions.....	18,000	Telegraphic cipher river reports.....	1,000
Circulars.....	13,650	Useful information for ship-masters.....	3,000
		Reports, Alabama weather service.....	24,000
		Miscellaneous papers.....	56,049

The work in this subdivision shows a slight increase over that of the preceding year, and experience, better quality of paper, inks, &c., and closer attention to details have produced a marked improvement in its execution. Some new material has recently been added which it is hoped will within the coming year tend to further advancement in this respect. The blank-work of the office has been so much increased during the year as to have added materially to the labor of the subdivision, but it has been handled promptly and executed creditably considering the fact that the machinery in general is old and worn from long-continued usage and must soon be replaced.

There have also been lithographed 745,260 base-maps, 669,823 maps and charts (miscellaneous), 119,935 forms and blanks (miscellaneous), 133,380 letters and letter-heads.

There has been a decided improvement in the lithograph work since my last report, and that now executed at this office is creditable to the service, and will compare favorably with that of any other department or private firm.

#### DISTRIBUTING ROOMS.

The work of this subdivision has been much increased within the past year. Applications for the publications of the Service have been steadily increasing in number and it has now become necessary to devote both considerable time and labor to their consideration and also to exercise much discretion in action thereon.

The special feature of the work of this subdivision has, however, been the opening of new records, which has entailed a large amount of clerical and other labor, as it was necessary to select from a large number of correspondents, both foreign and domestic, those who were properly entitled to receive the full series of the respective publications, and then to transfer both their names and addresses to the permanent lists therefor. Much care and discrimination have been used in this work, and it is believed that as soon as it has been entirely completed (which it is expected will be done at an early date) the system of record will be found convenient, practical, and well adapted to the requirements of the division. The regular issue of all current publications have been made as promptly as practicable, and in addition to these, surplus Signal-Service notes and professional papers which remained on hand after the regular recipients had been supplied were distributed as judiciously as possible, chiefly among that worthy class, voluntary observers, who could properly appreciate their value, and by whom it was thought they would be regarded both as a slight recognition of their services and an incentive to future effort. The arrangement of the retained publications in suitable order has been continued and the "Reserve Publications" are next to be taken up as soon as time and opportunity permit.

The division in general is now believed to be in much better condition than at the close of my last report. Without entering specially into details I may state that modes of operation have been adopted which are better suited to the work to be done and which have materially lessened the labor. The usual series of publications has been continued, and while it was necessary, in consequence of the greater public demand, to increase the editions, due attention has also been paid to their contents, the scope of which has been much extended and the subject-matter, it is believed, proportionally improved. There is still ample room for improvement; but it is thought that the division as now organized will be found capable within the coming year of the proper and creditable performance of the duties that may devolve upon it.

The total number of employes in the division at the close of the year is 44, consisting of 20 enlisted men and 15 civilians, classed as follows:

Clerks .....	4
Draughtsman in charge .....	1
Draughtsmen .....	4
Printer in charge .....	1
Printers .....	13
Lithographers .....	4
Proof-reader .....	1
Pressman .....	1
Pressboys .....	6
Stitchers and folders (3 only on temporary duty) .....	6
Engineers .....	1
Messengers .....	1
Laborers .....	1
<b>Total</b> .....	<b>44</b>

S. M. MILLS,

*Captain Fifth Artillery, A. S. O., &c., in charge Publications Division.*

**The CHIEF SIGNAL OFFICER OF THE ARMY.**

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